THE MICRO USER

Volume 10
Number 6
August 1992
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FOR ALL ACORN USERS

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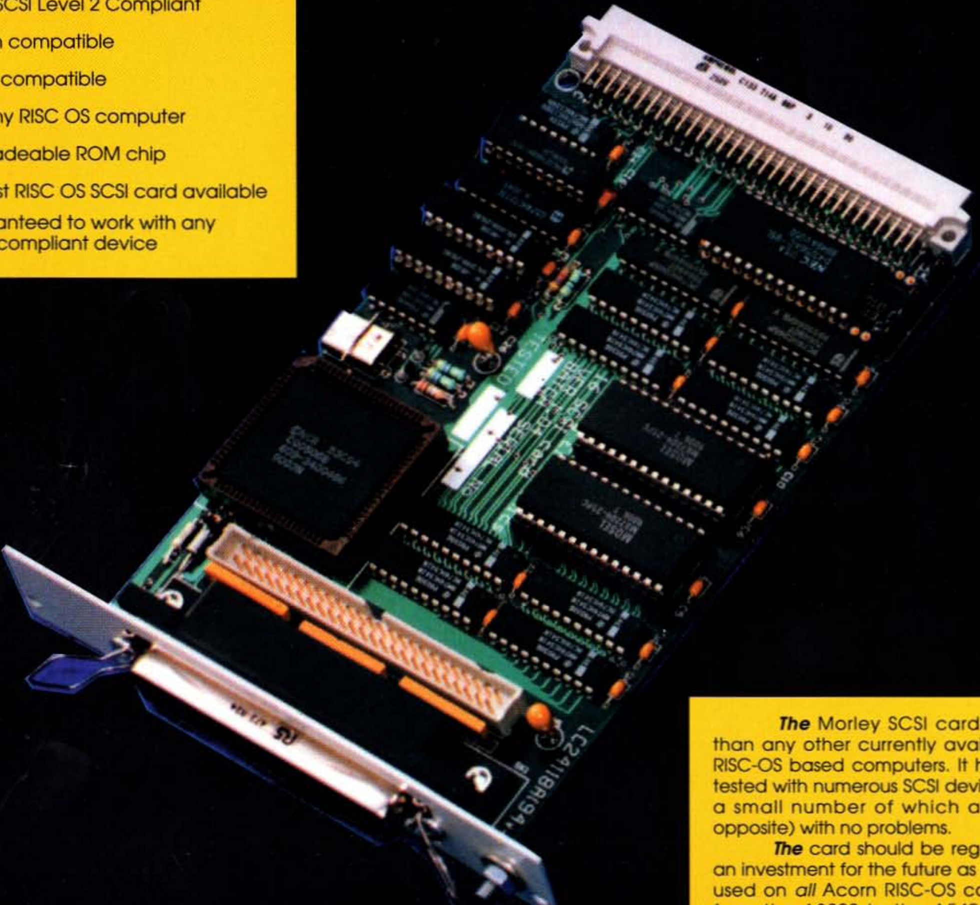

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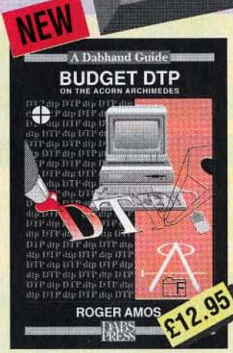

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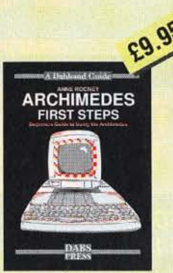

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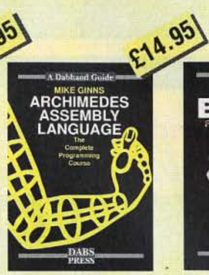

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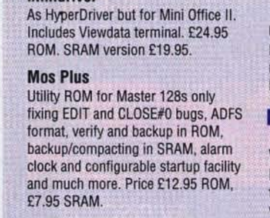
Games Action from Alien Images



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"a great deal of fun" *"fiercely competitive"*

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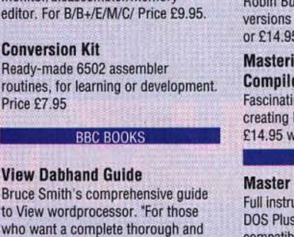

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Portable power

Acorn's long-awaited portable Risc-based machine has been released.

We give it the once over and compare it with its main competitors.

Check it out on Page 20.

REGULARS

News 11
Subscriptions 12
Freebies 18
*** Body Building** 34
Public Domain 45
Problem Solved 55
Mad Hatter 82
Letters 88

FEATURES

*** Rom and Ram** 48
*** Safe Scientist** 52
Getting the Boot 60
Applications Part 2 62

REVIEWS

Digital cameras 25
Screenplay 39

EDUCATION

Education Update 29
Education Reviews 30

ESSENTIAL

Desktop Publishing 57
Computer Aided Design 65

* This symbol indicates that the feature contains at least one full length listing for you to key in on your micro. All programs for your machine are on the subscribers disc.

Get it right

All the major listings in this magazine are accompanied by checksums to help you key them in correctly.

For full details of how to use them see the article on Page 86 of the February 1992 issue

THE MICRO USER
THE MICRO USER

August subscription disc

This month's discs are chock full of goodies from the program listings in this issue and from the Public Domain world. The 8-bit BBC Micro disc is crammed with some superb PD games and pictures while the Archimedes disc features:

- A brand new version of the amazing ArcFS archive reader
- Sound sample compressor
- ProTracker playback

... and much much more.

If you'd like to know more about how to get your very own disc FREE each month, turn to Page 12.

BARGAIN BASEMENT

Hardware and software classifieds are on Page 28

Next month in THE MICRO USER

we'll be taking a look at installing hard discs plus some new hardware for your micro and how you can use it with your system. Plus all our regulars, reviews and the money-saving PD page.

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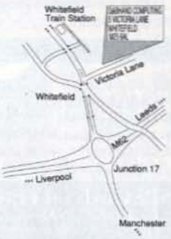

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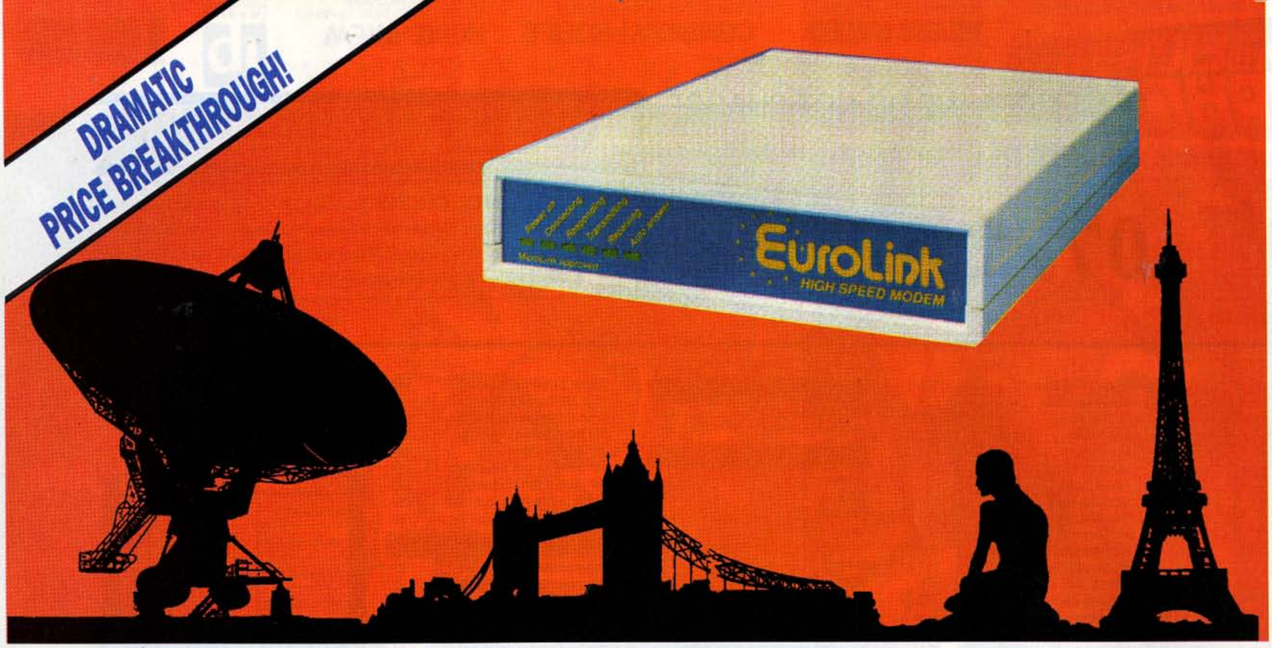

There's an electronic Aladdin's Cave of shareware and PD programs . . . just waiting to be explored!

Due to the tremendously high demand, the price of the acclaimed EuroLink modem has been reduced to £149 – a reduction of £80 on the previously advertised price of £229.

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NEWS BEAT

New faces

RHEINGOLD Enterprises (0484 846126) is the new company of Alan Wrigley with a series of products due for imminent release. First off the blocks will be TextAid priced at £9.95.

This program lets you define, edit and store up to 20 text macros of 40 characters each of which can be inserted with a mouse click into any desktop publisher or wordprocessor and so on.

The current date and time can be added as can items such as an incremental value, while an additional facility intended for such text processors as Edit lets you include control codes in documents to access printer functions such as bold or italic. Support for these facilities is provided as modifications to the printer driver.

The other major function of TextAid is to transfer text from any text icon or window title bar visible on the desktop into any document. In addition there is a facility to convert CSV or TSV files to text and vice versa.

Rheingold's second release will be TimeLord which is heralded as a comprehensive time management application providing multiple stopwatch and timer facilities among others. This will be followed by Archetype, the successor to Labelmaster Plus.

Vertically distributed

GREYHOUND (0532 621111) have now got the exclusive distribution rights to the products of Vertical Twist – formerly known as The Serial Port.

These include the Archimedes Joystick Interface, a Midi Sampler and software such as Worldscape, Tracker and Investigator.

MD of Vertical Twist, Andrew Foyle commented: "The move will allow us to specialise in research and development and to concentrate on the things we do best. Greyhound are specialist Acorn software distributors and we have little doubt that the Acorn market will be well supplied and supported by them".

Going for gold

WHAT have Acorn Computers, Krisalis Software and the Chafford Hundred all in common? The answer came in the form of a media extravaganza at the Queen Elizabeth II Centre in Westminster recently with the launch of the Acorn Olympic Challenge and a new Learning Curve combination to coincide with the Barcelona games.

The Acorn Olympic Challenge began on July 4 and saw members of the public competing against 170 of the best athletes in the world. This is not a test of strength or speed but a computer simulation which takes you to the actual track and field events themselves.

Within the game you'll meet such famous world class athletes as Steve Backley, Linford Christie, John Regis, Sally Gunnel, Yvonne Murray, Colin Jackson and Dalton Grant as well as team captain Fatima Whitbread.

All are members of Fatima's prestigious Chafford Hundred Athletic Club and have been an integral part of the game development.

The Challenge is based around Krisalis Software's olympics game, Quest for Gold. In its full implementation the simulation comes in two parts. The first section places you as the trainer who must decide the schedule for your 10 olympic hopefuls.

On-screen help is offered by the Chafford Hundred athletes which you can follow or ignore.

Asked about Quest for Gold, Fatima commented: "The game is great fun and we all hope it will attract a great deal of interest among budding athletes who may themselves one day be competing at Olympic level".

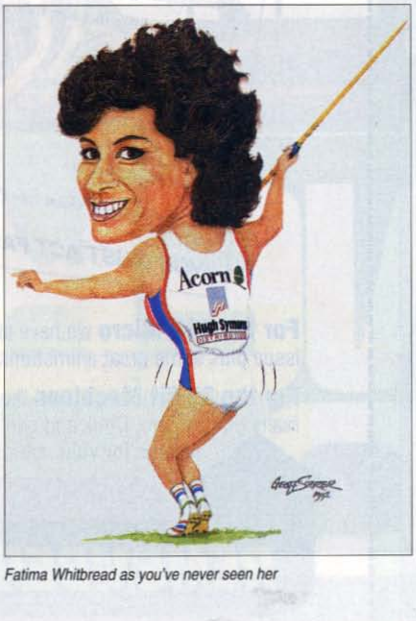
The Acorn Olympic Challenge presents a special version of the arcade section of the game and each competitor will be given a certificate and the opportunity to win one of several hundred prizes.

Highest scorers go forward to the four regionals and from there to the post-Olympic athletics meeting in Sheffield in August for the Grand Finale.

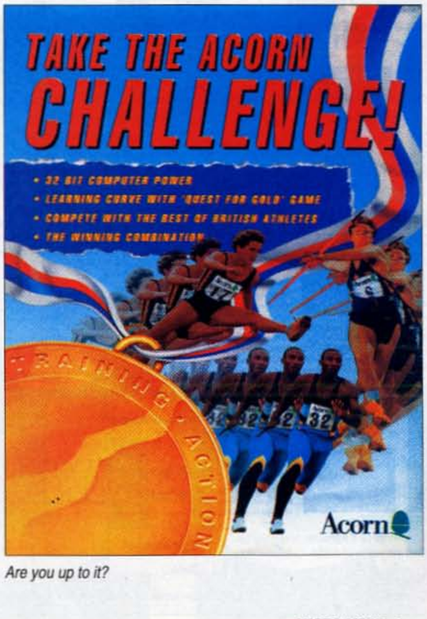
Not only will they get a chance to meet the top athletes, they will also be invited to look behind the scenes. Full details of all the 100 locations throughout the UK taking part in the challenge can be obtained by phoning 0800 678 888.

In June Hugh Symons held a *recruitathon* to introduce the Quest for Gold promotion to Acorn dealers. Fatima Whitbread was the guest of honour and was presented with a caricature of herself specially drawn by Hugh Symons' Advertising and Marketing Manager, Geoff Storer.

Quest for Gold is also being included in Acorn's Learning Curve packs for a limited period only. You can read more about the full game in this month's ScreenPlay.



Fatima Whitbread as you've never seen her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Yours sincerely

Steve Turnbull,
Editor, *The Micro User*

P.S. Don't forget to claim your FREE game.

YOU MUST ACT FAST

For the BBC Micro we have all the type in listings from this issue plus some great animations by Mike Goldberg.

For the 32 Bit Machines the screen editor for Inertia a really funky demo, Dook and two fun games as well as all listings for your computer and the 8 bit machines.

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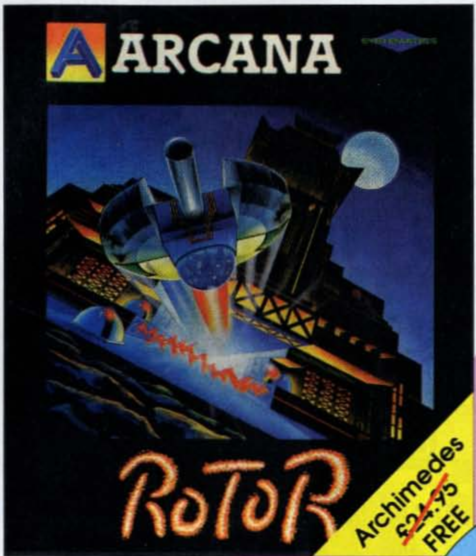
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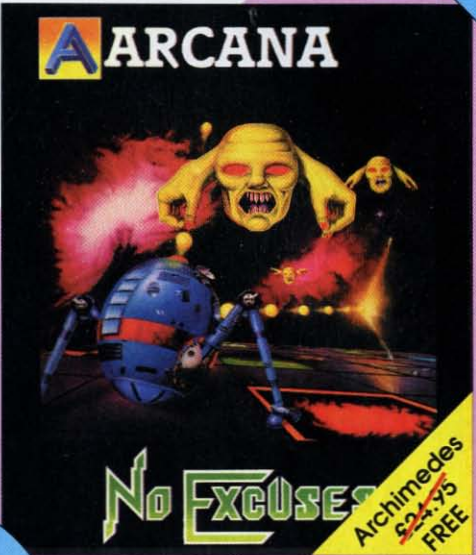
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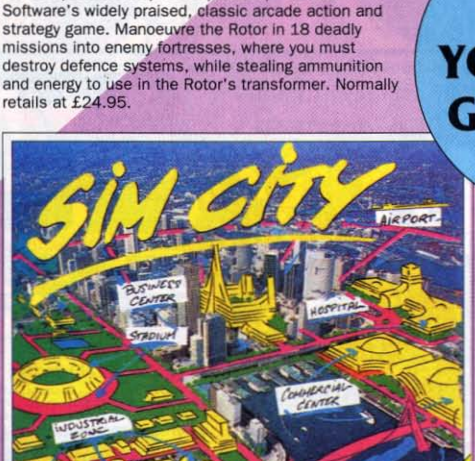
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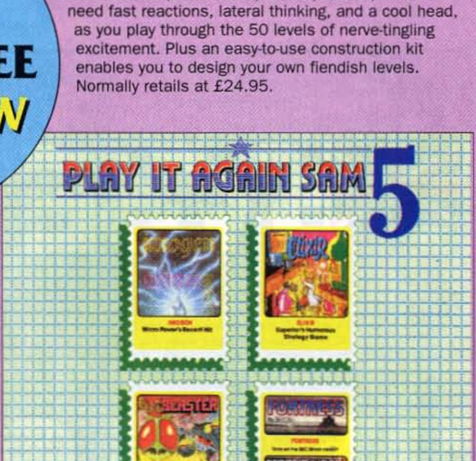
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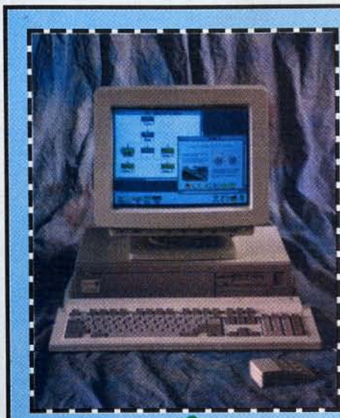
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My World Utilities Discs

Created by Dave Hollett these discs are top quality multi-layer drawings for use with the My World program. Ideal for Schools, and a useful tool for the National Curriculum (KS 1/2). "EXCELLENT" A&B Review June 92

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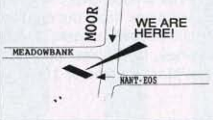

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!Condense

!Condense is a Spritefile Compression utility, it will allow you to store more files on disc or in memory. Unlike most routines unpacking is not done on loading, but as and when you are ready to display or use the Sprite(s) in the spritearea. This means that a large number of sprites can be loaded into memory, unpacked to the same 'User Sprite Area' and plotted using normal Acorn Sprite Calls. An example of this is in a demo file (!Condemo2) on the disc and can be seen running. This loads in approximately "THREE MEGABYTES" of sprites but uses just over 400 Kilobytes of discs space or computor memory. Ideal for use within your own programs for really fast sprite and screen manipulation.

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A standing Ovation

RISC Developments (0727 40303) have released the first major update to their DTP package, Ovation. The price is still only £99 and the discs are no longer copy protected.

Ovation is used in education as well as for business and home use and the new features of version 1.3 are partly in response to feedback from users. These include the ability to merge Ovation documents with CSV files generated by databases and the like, and scaling and rotation for printing booklets with correctly ordered pages.

Desktop Thesaurus

There's also the facility to rotate drawfiles – and sprites if you have Risc OS 3 – to any angle.

There is also increased connectivity with other software packages with 1st Word Plus files able to be imported directly complete with style information. A Desktop Thesaurus hotlink automatically transfers words between the Thesaurus v1.10 and Ovation.

The Thesaurus was launched earlier this year and the new 1.10 version has been significantly expanded to include over 13,750 keywords and nearly 135,000 synonyms.

An improved compression system ensures that the entire application takes less than 450k of disc space. Upgrades cost £3.35 when you return your original disc and the complete Desktop Thesaurus is priced at £19.

A host of other improvements include a fast draft print option, an easy-to-read System font in four weights, faster drawfile rendering and improved key short-cuts.

Readers with an A5000 and Risc OS 3 can also rotate text in drawfiles, have 256 grey-level sprites and a desktop boot facility.

Expand scanning options

IRLAM Instruments (0895 811401) are now providing colour scanning systems that can use the built-in ports of the A5000. Not only does this free your expansion slots for other products but it significantly reduces the cost as there is no expansion card to buy.

Two options are available: One with the A4 flat-bed Epson scanner and the other with the Sharp JX-100 mini-flatbed model. The complete range of Epson scanners is supported by the ProImage software.

Epson use the parallel port for fast data transfer while the Sharp model uses the serial port. Irlam's software, the I-Mage, ensures that the maximum possible data transfer speed is obtained at all times and offers the same powerful features as ProImage.

Both pieces as software are fully multi-tasking and you can see the image built-up on screen as it is scanned. Once scanning is complete you can edit the sprite immediately.

There is a comprehensive number of sprite output formats with monochrome, 16 and 256 grey levels as well as 256 colour in normal, multi-sync and VGA modes. Huge scanned image support lets you scan to disc without using memory for the image. The Epson GT6000 costs £999 with the Sharp JX100 retailing at £495.

If you have an Archimedes but not the A5000, you can buy an expansion card for your machine to let you use these scanners and their software. The price is £49.50 for the Sharp JX100 and £98.50 for the Epson range.

Acorn Open Days

Acorn and dealers hold regular Open Days all over the country throughout the year. Look out for the ones in your area, it's your chance to talk to Acorn themselves as well as a selection of hardware and software manufacturers. Look in your local press, contact your Acorn dealer or Acorn directly for full details and updates:

Date	Town
Sat/Sun 12-13 Sept	Birmingham
Sat 19 Sept	Portsmouth
Sun 20 Sept	Colchester
Sat 26 Sept	Blackpool
Sun 27 Sept	Oldham
Sat 3 Oct	Bolton
Sun 4 Oct	Sheffield
Sat 10 Oct	St Helens
Sun 11 Oct	Rotherham
Sat 24 Oct	Swindon
Sun 25 Oct	Slough
Sat 31 Oct	Nottingham
Sun 1 Nov	Stoke on Trent
Sat 7 Nov	York
Sun 8 Nov	Northampton
Sat 14 Nov	Middlesborough
Sun 15 Nov	Hull
Sat 28 Nov	Derby
Sun 29 Nov	London (South Mimms)
Sat 5 Dec	Brighton
Sun 6 Dec	Gatwick
Sat 12 Dec	Bradford
Sun 13 Dec	Leicester

The Micro User editors will be in attendance at the highlighted shows

CD-Rom prices fall

THE price of Cumana's CXX436 multiple six-pack CD-Rom drive unit has been dramatically cut by £500 from £1,995 to £1,495. The six-pack features six high-quality CD-Rom drives and is designed for use on a network.

All six drives can be run simultaneously and this multiple feature distinguishes the CXX from the juke box drives which load just one disc at a time.

Each drive offers an average access time of 350 milliseconds and data transfer is at 153.6k per second and complies with the standard High Sierra format (ISO 9660).

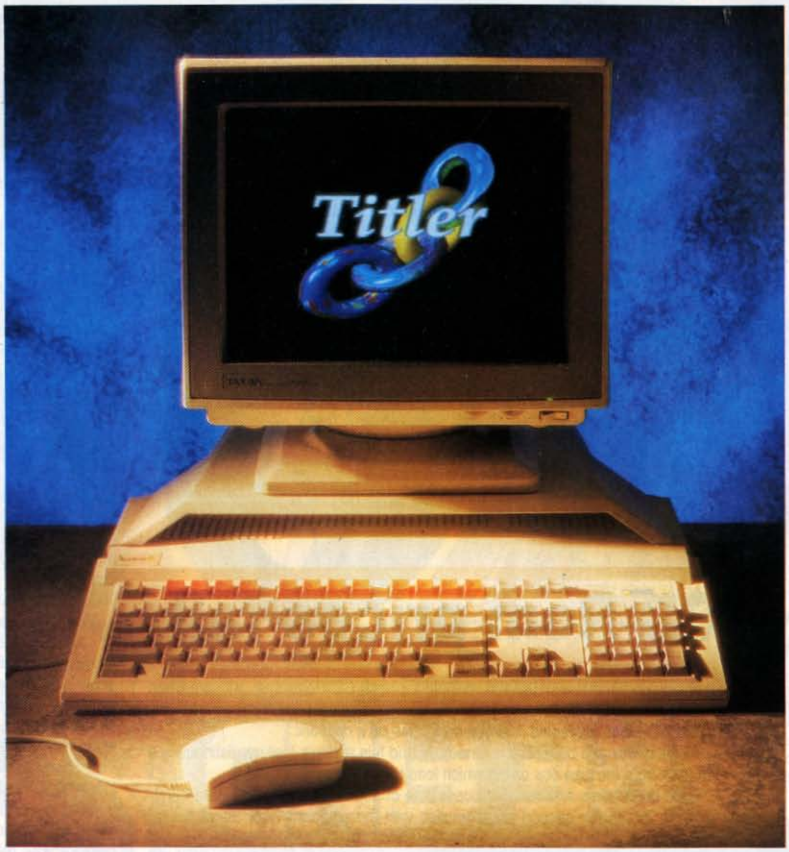
The caddy system of loading enhances the easy handling and storage of the CD-Roms and the entire CXX436 is housed in a heavy duty metal case and requires a single power source.

Really useful CDs

APA Multimedia (0634 295222) have announced their first CD-Rom for Risc OS machines. Given the name of The Really Useful CD-Rom Volume 1, it contains clip art in draw and sprite format as well as a host of sound samples.

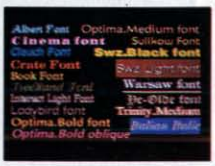
Digitised images are provided from their soon to be released Wildlife on Rom which should get its first public showing at Bett '93. Many different applications in the CD Rom fall into the categories of programming, utilities, games, communications and education and all for £49.

From the people who brought you Pro-Artisan, Render Bender and Illusionist; another link in the chain.



With Artisan II, Pro Artisan, Render Bender and Illusionist you can create amazing graphics and superb animations. But a picture, however detailed and complex it might be,can only say so much.

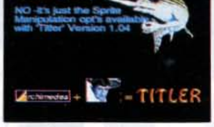
So with just that in mind, allow us to introduce Titler. It does exactly what the name suggests. It enables you to add words to your pictures. Titler is two programs combined, Titler and Sequencer. Titler is used to create screens containing text of any size and colour. It can provide drop shadows, underlines and rub out boxes. Using Sequencer you can present your screens using effects such as, unroll, scroll, fade, wipe, almost anything you can imagine.


Albert Font
Optima.Medium font
Cinema font
Sullkow Font
Claudi Font
Swz.Black font
Crate Font
Swz.Light font
Book Font
Warsaw font
Interact Light Font
Ye-Olde font
Ladybird font
Trinity.Medium
Optima.Bold font
Italian Italic
Optima.Bold oblique

Add some animations from Render Bender or Euclid, some music from Sound Tracker and you have an amazing presentation to stop people in their tracks. Add a Genlock board and you can transfer the whole thing to video, overlaying onto any video source just like the professionals do.

In short it links you with the world of professional video, via the Archimedes.

Obviously this is only part of the story, so for more information write or telephone for a fact pack. And we'll send you more words and pictures about Titler.



Something Fishy

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Heavyweight printing

FOR people with large needs the A4/A3 LZR 1560 laser printer from Wenger could be of interest especially as it offers both PostScript Level 2 and HPGL compatibility.

This is a heavy duty printer and prices start at £4,500 with a 15ppm output in A4 mode and 8ppm for A3 production. It can print in either 300 or 400dpi – though your ability to access 400dpi will depend on your third-party printer driver.

As to be expected for a heavy duty model there are several paper feed options. You can choose a 250-sheet single, double and triple tray model as well as a 250-sheet correct order collection tray.

The LZR 1560 will also handle a good range of paper weights from 60 to 90gsm handled automatically with the ability to process 116gsm paper manually. It comes as standard with 4Mb of memory which can be upgraded to 16Mb.

Bookshelf

CREATIVE Basic is a new book from K&M Publishing (0490 2328). Priced at £5 it has been written by D. Martin Evans a veteran commercial programmer on a variety of machines.

The book describes functions, procedures, sub-routines, programs and tips for making Basic more productive. The routines are written mostly in Turbo Basic so they can be readily transferred to other dialects and machines.

The routines covered are the result of years of problem solving and cover, among others, string manipulation, dates, numeric functions, box drawing, menuing, conversions, indexing and designing full-screen editors.

Intrepid Treloar

THE Lord Mayor Treloar College in Alton in Hampshire is the largest non-maintained special boarding school in Britain. It caters for students between 9 and 18 years of age with physical disabilities and has used Archimedes computers since they were first launched.

They now have 40 machines in use, for both teaching and administration, playing an important part in helping students – with a wide range of handicaps – with academic and vocational work.

The staff of the college have developed a range of adaptations and a technical aids department produces special equipment tailored to the needs of individual students.

They quickly developed a miniature trackerball for students who haven't sufficient arm movements to use a mouse – it has a locking Select button to make it even easier to use.

Students with cerebral palsy found the keyboard and mouse impossible to use but the solution came in the form of a robust joystick. This resists the muscle spasms that make the control on other devices impossible.

Helen uses a trackerball and keyguard

A more complex problem arose when it came to customising a system for the many students with muscular dystrophy who found the standard keyboard too wide and deep to reach across.

The solution was a miniature keyboard with mini keys so that they cover as little area as possible. The numeric keypad was omitted and the keyboard has some special keys to combine Shift/Break and Control/Break as well as a Shift Lock.

These variations all help one-handed students and have allowed students with a pointer attached to their head to work effectively on a wide range of packages.

The Archimedes range now forms the nucleus of the teaching system and allows the students to follow the National Curriculum especially when using such packages as ASP and SpKbd from from Bristol Semerc (0272 733141)

SpKbd offers a versatile mouse emulator on the numeric keypad. The program can be customised with the teacher being able to alter the input acceptance time, post acceptance delays and sticky Shift and Control Keys.

ASP offers full keyboard and mouse emulation using a system of scanning boards set up for individual users and/or applications. These boards can include sprites and special fonts as well as standard text icons. ASP can be used by people with single or double switch input devices as well as a combination of pointer moving device and a single switch.

A high-speed concept

USING a modified Concept Keyboard, ComputeRace (0386 792545) have developed a single-user lap-timing system for up to 48 cars in a single race. For each event an overlay is placed on the keyboard and a segment assigned to a particular car.

As a car flashes past, the user touches the relevant segment and the time is entered into the system. For even better accuracy a beam can be used to record the time while the keyboard identifies the car.

As well as acting as a computerised stopwatch, the system sorts the data into a variety of formats. By keeping a precise account of lap speeds teams can gauge when to fit the slicks – a highly expensive set of tyres which increase the speed potential of the car.

Originally designed for the IBM PC range, the Concept Keyboard Company (0962 843322) report that this process will work on any machine with a serial port.

The Birmingham Super Prix has already benefited from this system where the harsh race track environment rules out a conventional keyboard.

Indexing the facts

ARCSCAN III is a reference finder for books, magazines and manuals providing indexes for Archimedes User Guides and manuals on Basic, C, Fortran 77 and the DDE suite. In addition there are up-to-date indexes to all the BBC and Archimedes magazines.

Library discs and new indexes are available and constantly updated. The complete package is £15.95 with library discs and upgrades varying between £4.45 and £9.95. All are available from Risc Developments (0727 40303)

Achtung baby

THE demand for foreign languages has never been so high and LCL (0491 579345) are reacting to this by releasing their first new title in over two years, Micro German for the Archimedes and BBC Micro.

This is the first computer course to take beginners up to GCSE standard in spoken and written German. The course also covers business German.

The complete course of spoken and written German is suitable for travellers, students, enthusiasts and businessmen as it includes a program to generate business letters automatically.

The aim is to de-mystify German and make it fun with the inclusion of graphical adventure games and puzzles which are alternated with more serious programs on verbs and grammar.

Micro German costs £24 and covers pronunciation, colours, gender, tenses, cases, plurals, opposites, time, conversation, commands, aural work and much more.

FREEBIES

The right moves

APRICOTE Studios have just launched Prophet, their new accounts package for the Acorn 32 bit machines, and with that comes a unique utility !Transfer.

And there's a free copy waiting for five lucky readers.

With it you can copy text from any icon to any other, or to a text editor such as !Edit or Impression with just two clicks of the mouse:

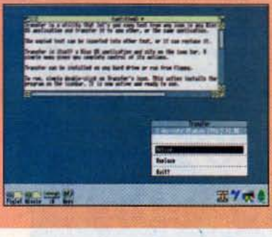
- Click with Adjust to copy the text
- Edit it, if needed, in the !Transfer iconbar menu
- Click with Select to paste the text to another icon
- Either replace or add to existing icon text

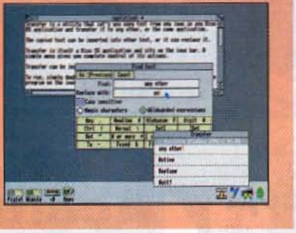
Now, with !Transfer, you can copy the results of a calculation in a multitasking calculator directly to your document whether it's a simple text editor, spreadsheet or DTP package.

What to do

The first five readers' names and addresses pulled out of the sack after August 30 will receive a FREE copy of !Transfer.

Just write to: Micro User Freebies Offer (August), Europress Direct, P. O. Box 2, Ellesmere Port, L65 3EA.





Drawing you in

PROFESSIONAL-looking graphs can now be created quickly, accurately and easily with a new package called Graph_It from Sherston Software (0666 840433).

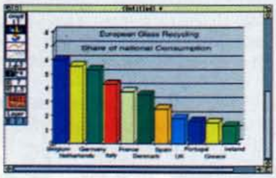
Designed with schools in mind it has no complicated spreadsheet or database package to master first. Graphs are produced by moving and clicking the mouse.

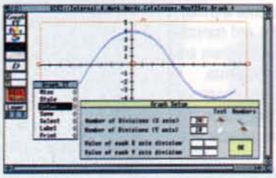
If you wanted to create a bar chart, simply *pull* the bar up to the height you want or rotate a segment of a pie chart just by grabbing the handle and moving the mouse. If you prefer values can be added using the number keys.

Graph_It also has facilities to draw line and scatter graphs and you can flip between them at the touch of a button. Where appropriate you can have 3D versions for a professional feel.

Labelling is just the matter of adding, editing and placing manually on your graph and displayed in any available fonts. Sherston package Graph_It with the Junior, Montclair and Tabloid fonts.

Finished work can be saved as drawfiles for importing into other applications or in its own Graph_It format. The price is £19.95.





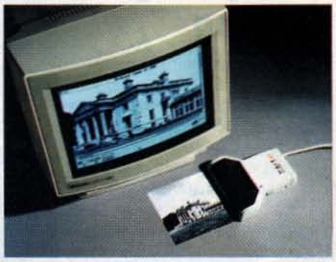
Number of Divisions (X axis)
Number of Divisions (Y axis)
Value of each X axis division
Value of each Y axis division

Second generation ScanLight scanners

THE next generation of Computer Concepts' (0442 63933) ScanLight handheld 256 grey-level scanners is now available. The latest addition to the ScanLight range has a new scanner head, software and a lower price of £233.92.

ScanLight 256 offers a maximum resolution of 400 dpi true 256 grey levels at full 105mm width with support for monochrome, 16 and 256 grey-level scanning at 100, 200, 300 or 400dpi.

The new software is available as an upgrade for £11.75 to all registered users of ScanLight models. The enhanced features include on-screen dithering, instant image rotation by any angle, flexible image enhancement control – sharpening, edge enhancement and a precise grey map control tool.



Other aspects have been made easy to use such as the brightness and contrast controls as well as the choice of sampling sizes. The software also makes smaller demands on memory than some similar programs as only one copy of the image is held in memory at once.

Adding the power

COMPUTER CONCEPTS (0442 63933) are ready to release a new generation of Turbo printer drivers for the Archimedes range of computers. First off the line is an ultra-fast Risc OS driver for the Canon inkjet, the BJ10e.

The drivers merit the accolade of turbo because of Computer Concept's FastText rendering technique first seen in the LaserDirect range of laser printers. This gives fast and effective outline font printing with printer times reduced by one third when compared to the standard Acorn drivers returning control to the desktop up to 10 times quicker.

Using these TurboDrivers, once the page has been rendered printing goes on in the background so that the computer can be used while the printer is running. Printing from disc or from memory can also be done in background mode.

The iconbar icon informs you if the printer is on line and there is additional information available in a status window which shows the number of pages in the queue and the current state of the printer.

TurboDrivers comes with 12 Acorn outline fonts and the outline font manager as well as a printer lead and manual and costs £49, though you can buy the printer, TurboDriver, lead and software for £249.

Pricey but it's colour

ONE of the leading suppliers of colour PostScript laser printers is Colorgraph (0734 819435) who have just reduced the price of two of their models.

The A4 CHC-S445P is an A4 colour model which has been cut in price from £13,750 to £11,450. This is a dye sublimation printer with a 300dpi resolution and was launched last Autumn when it was the only such machine in the UK.

The standard model comes with 32Mb of ram and produces colour print which look like traditional full colour photographs. It achieves this by using up to 16 million colours per dot which gives better colour control than has been possible with 300dpi printers.

On the thermal transfer side of colour printing the A4 300dpi CHC-445P has dropped from £5,600 to £4,695.

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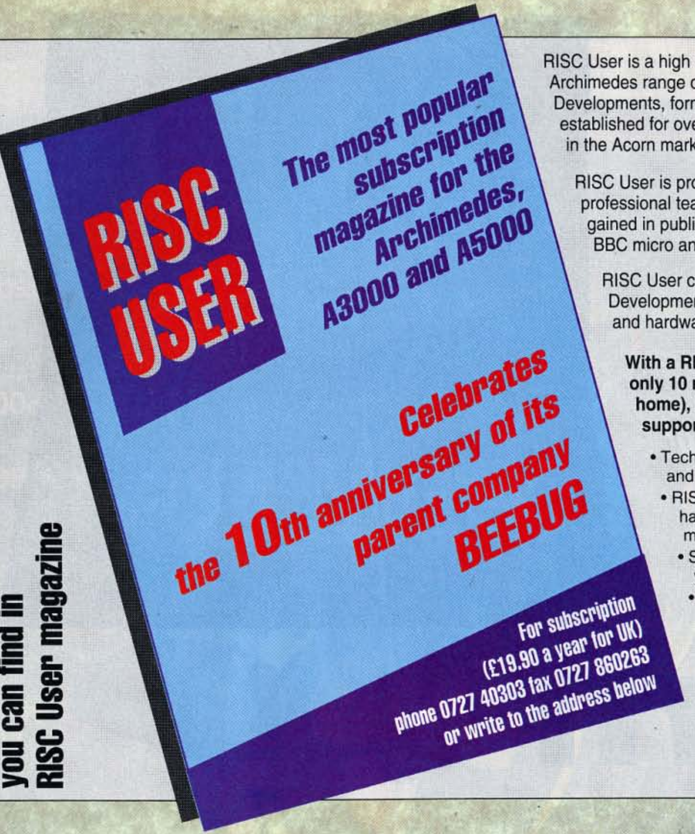
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RISC User is produced by a dedicated and enthusiastic professional team which benefits from10 years of experience gained in publishing the popular BEEBUG magazine for the BBC micro and the Master 128.

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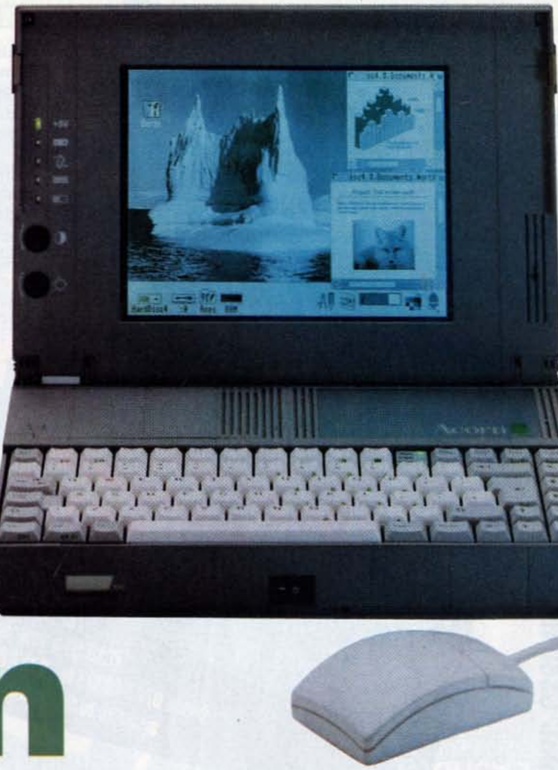


Steve and Pam Turnbull take an in-depth look at the Archimedes A4 portable and its competition from other manufacturers

Acorn on the move

Product: A4
Price: £1,399 (2Mb ram), £1,699 (4Mb ram, 60Mb hard disc)
Supplier: Acorn Computers, Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN.
Tel: 0223 245200

HAVING escaped relatively unscathed from embargo and rumour the new Acorn portable is out and about – but you'll have to wait until September to actually buy one.

But where is the A4 positioned in the marketplace and who is going to buy it?

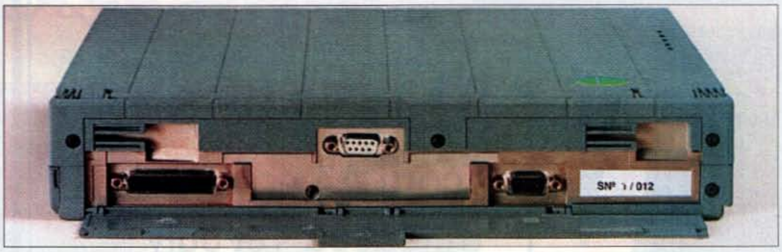
Acorn are predominant in the education market. With government moves encouraging the purchase of portable computers in this area it was only a matter of time before Acorn answered the challenge set by Apple and the hundreds of IBM PC portable clones. They see a wider market opening before them, but does the A4 put them in the position to launch such an attack?

First look

The very fact that Acorn have released a notebook-sized portable says much about the company's change in direction over the last few years. Gone are the days when they refused to admit the existence of other machines or to acknowledge other consumer needs than those they were already meeting.

A quick glance at the machine and you may be excused for thinking that it is a Triumph-Adler notebook because the casing is the same. This is understandable because Acorn's major shareholders – Olivetti – also own Triumph-Adler. The casing is slightly bluish grey with an almost flock finish and once opened is very compact.

The keyboard is an 83-key PC layout which means that you lose the keypad. However a special blue function key gives alternate actions to cer-



All the ports you'll need

The 1.6 Mb floppy is standard

The Apple alternative

Product: PowerBook 140
Price: £2,195 (4Mb ram, 40Mb hard disc)
Supplier: Apple UK, 6 Roundwood Avenue,
Stockley Park, Uxbridge UB11 1BB.
Tel: 081-569 1199

The stylish PowerBook range is considerably more expensive than the Archimedes A4, yet they are both aimed at the same market: Teachers, school resources, businesses and professionals.

The nearest in price and specification is the PowerBook 140. It too has the connectivity seen on the A4 with Econet but this time through the built-in AppleTalk. The user interface is probably the next best to Risc OS and with the latest version of System 7 as standard it is very intuitive to use.

The keyboard is very nice as the slope makes it easy to use because there is somewhere to rest your hands which reduces stress on your wrists.

A trackerball is built-in and quite large, making it easy to use – the single button works very well with a trackerball. The keys are the same size as on a desktop model.

The PowerBook has some features to provide access for people with disabilities. CloseView magnifies a section of the screen for instance and third-party companies have products which let you charge a PowerBook battery from a wheelchair battery as well as special attachments to mount it on a wheelchair tray.

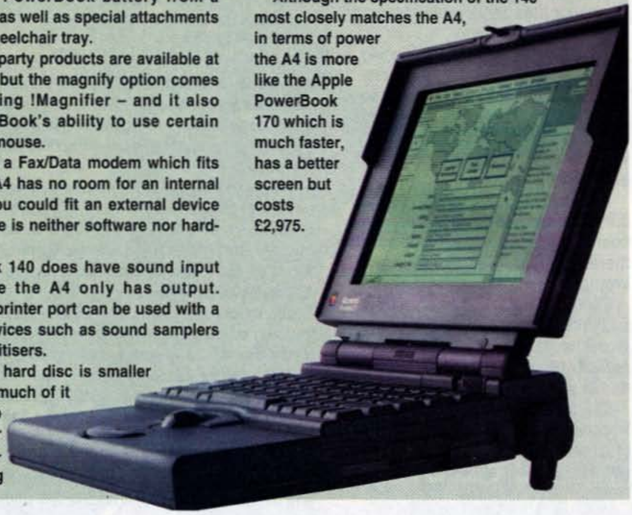
No similar third-party products are available at present for the A4 but the magnify option comes as standard – using !Magnifier – and it also shares the PowerBook's ability to use certain keys in lieu of the mouse.

You can opt for a Fax/Data modem which fits internally but the A4 has no room for an internal device like this. You could fit an external device but at present there is neither software nor hardware.

The PowerBook 140 does have sound input and output while the A4 only has output. However the A4's printer port can be used with a wide variety of devices such as sound samplers and even video digitisers.

The 140's 40Mb hard disc is smaller than the A4's and much of it will be taken up with the cleverer bits of Apple's proprietary operating system, System 7, whereas all of Risc OS 3 on the A4 is in rom.

Although the specification of the 140 most closely matches the A4, in terms of power the A4 is more like the Apple PowerBook 170 which is much faster, has a better screen but costs £2,975.



tain keys. With it F11 and F12 appear as special functions F1 and F2 while the keypad uses a group of keys in association with the special function lock. The feel of the keys is solid but the layout and angle of the keyboard will take a little bit of getting used to.

A mouse comes as standard though we did feel that the lead was a too long for a portable – it's exactly the same as the desktop models.

The inclusion of a trackerball was considered and the casing actually has a place for one. However, as most people are used to a mouse, and using three buttons with a trackerball is not very practical, Acorn decided against this option.

Mouse movements can be reproduced using the special function key with the cursor keys for movement and QWE as the buttons.

A simple carrying case comes with the A4 but for £35 you can get a padded shoulder bag with a net for the mouse and space for everything including the manuals. Many bag manufacturers specialise in this area so you could easily pick up your own.

On display

The screen is 182mm x 137mm LCD with a fluorescent edgelighter and brightness adjustment. The resolution is 640 x 480 pixels or VGA (PC high resolution).

Acorn have opted for a mono 16 greyscale display even though on the PC side colour is becoming more common and considerably more expensive. Some PCs do claim 32 or even 64 greyscales but you find that only eight are really noticeable anyway.

You can add an external monitor via the 15 pin VGA D-type plug should you be using the machine for applications such as presentations which would benefit from colour and a larger screen.

On LCD screens the time for the image to disappear can be up to half a second. For a mouse pointer moving around the screen the result is *smudge* – nothing can be done about it so you just have to get used to it.

We also found that we tended to lose the pointer occasionally and moving it around the screen quickly – the usual method of locating a lost pointer – doesn't help much, you have to learn to go slower.

Power is from a rechargeable battery pack or the mains. When on mains the battery trickle charges, but it does take around seven hours to reach a full charge.

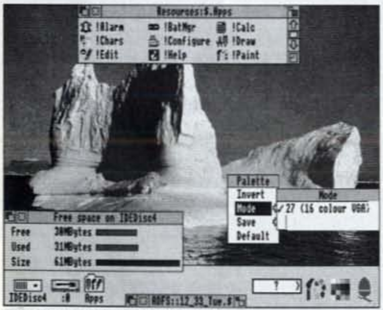
How long your battery lasts depends on your usage – as a rule, hard disc access takes a lot of power – but you can get from 2.5 to 4 hours. You can buy extra battery packs for around £50.

Most portables these days come with built-in power managers and Acorn's system gives an on-board independent microprocessor the management of battery charging and power use.

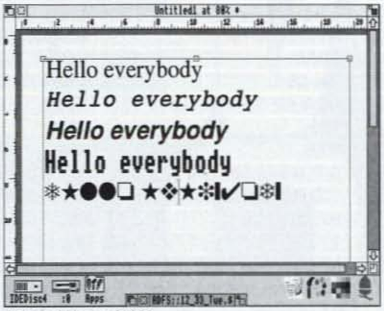
Power consumption is minimised between keystrokes and you can customise the power saving setting when it comes to blanking the display or spinning down the hard disc.

If you do run out of power an auto-

➤

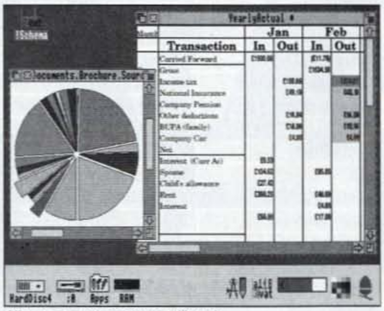


The A4 screen is high quality



Hello everybody
Hello everybody
Hello everybody
Hello everybody

This could be an A5000



All your normal programs still work

matic shutdown is preceded by a standard Risc OS warning box which is repeated when you restart.

A petrol gauge-type indicator at the front of the keyboard gives an idea of the state of the battery and there is also an onscreen monitor.

The power supply is auto-ranging which means you can plug it into any mains supply from 100 to 240v, so working abroad is easy. Full details of this is given in the documentation which is easy to follow and has an excellent troubleshooting section.

As well as adding an external monitor, you could opt for another keyboard, keypad or even a modem – there is no room left inside for an internal system.

Econet, but not Ethernet, will be available too – though not in the model we saw – and the full Econet network filing system is included on rom as you'd expect.

The unit has both serial and parallel ports so you can add the full range of printers and add-ons but the A4 is not designed for adding expansion cards.

Sound facilities

The sound comes from a small internal speaker which is not very good – headphones will give a better result. Having said that there isn't another portable around that gives you a 7-position 8-voice full stereo sound system as standard.

As far as software goes the most remarkable thing about the A4 is the fact that it is an unremarkable A5000 – anything that runs on an A5000 will run on it. Everything on the A5000 has been squeezed into the A4's box with no exception and a few additions. Two versions are available: One with 2Mb of ram and a 1.6Mb floppy drive, the other with a 60Mb IDE hard disc and 4Mb of ram. Both have Risc OS 3 as standard.

The operating system is in rom, as are the eight applications of Draw, Paint, Alarm, Calc, Chars, Configure, Help and Pinboard. The other standard A5000 applications come on disc as usual.

The hard disc model also comes with the PC Emulator.

The PC competition

Product: CF-380
Price: £1,895 (2Mb ram, 60Mb hard disc)
Supplier: Panasonic, Panasonic House, Willoughby Road, Bracknell, Berkshire RG12 8FP.
Tel: 0344 853550

Panasonic's Notebook 380 is only one of the many machines available in the IBM PC-compatible area but its specification makes it a good comparison to the A4. It also has a graphical user interface as standard – Windows 3.

This model boasts a 32 greyscale screen but in comparison to the A4 and 140 there appears to be very little difference in use. All have adjustable screens for changing the angle depending on the lighting conditions. Again all three models have power saving built in such as screen blanking and so on.

The mouse is optional but as with all these models you can use the cursor keys instead. If you opt for a mouse you'll have to open a flap and plug it in.

The A4 uses the same system, and this is one area where in our opinion the integral trackerball scores. It is a more robust system to use when on field work rather than just office hopping.

The CF-380 has a similar casing to the A4 but lacks the nice angle of the PowerBook. The petrol gauge battery indicator on the individual battery packs appears to be unique to the A4.

Although the PC doubles up keys for the keypad it does have all the function keys. One particular dislike with both the PC and A4 is the swapping of the Caps Lock, Control and Shift keys – very irritating.

We were a little concerned about the mouse smudge on the A4 but this is much smoother than the flickering action of the mouse used with Windows – rather than smudge it blinks very quickly which can be quite off-putting until you get used to it.

This is not the type of article to go into the merits of Risc OS 3 over Windows 3, but let's just say that Risc OS is significantly faster and the A5000 users will see no difference in access time.

Both the A4 and PowerBook computers can read 1.4Mb Dos disks on their standard floppy drives as well as their own format – with PC portables you're stuck with Dos.

Although the CF-380 has a 60Mb hard disc, it has the added handicap of both Dos and Windows 3 occupying huge amounts of space – 10Mb before you even start to add applications. Not only that but Windows applications also take enormous bites out of the hard disc. For example LetterPerfect – a cut-down Dos version of the popular WordPerfect – takes 3Mb while the full Windows version will take 10Mb.

Summing up

Taking the each system on its own merits it's fairly clear that the A4 easily beats the CF-380 on both quality and price without difficulty. Although the Apple portable is of equivalent quality – and probably easier to use – it has a much higher price.

Operating systems take memory and disc space on all but the A4, although the PowerBook is a switch-on-and-go machine like the Acorn. With the PC you actually have to install the operating system when you first buy it.

Having said that, your preference is bound to be related to the machines you're currently using although, in our opinion, the capabilities of the A4 make buying a PC-compatible portable a waste of time.

Comparing the specifications

S = Serial P = Parallel

Model	A4 – Model I	A4 – Model II	PowerBook 140	Panasonic CF-380
Price	£1,399	£1,699	£2,195	£1,895
Dimensions	297x210x53mm	297x210x53mm	286x236x57mm	310x254x44mm
Weight (excl battery)	2.3kg	2.3kg	3.1kg	2.9kg
Processor	ARM3 32-bit Risc	ARM3 32-bit Risc	MC68030	80386SX
Speed	24MHz	24MHz	16MHz	20MHz
Operating system	Risc OS 3	Risc OS 3	System 7.01	Windows 3
Floppy disc	1.6Mb ADFS, 1.44Mb Dos	1.6Mb ADFS, 1.44Mb Dos	1.44Mb	1.44Mb
Ram	2Mb	4Mb	4Mb	2Mb
Hard Disc	-	60Mb	40Mb	60Mb
I/O	S, P, monitor, keyboard	S, P, Mnoitor, keyboard	2x S, SCSI, ADB	S, P, VGA monitor, keyboard
Display	LCD 640x480 (15 greyscale)	LCD 640x480 (15 greyscale)	LCD 640x400 pixels	LCD 640 x 480 (32 greyscale)
Keyboard	83	83	63	85
Mouse	Y	Y	Optional	Optional
Trackerball	N	N	Y	N
Other	Applications, utilities and Basic V	Applications, utilities and Basic V	Optional internal modem	MSdos 4.01, GW Basic, utilities
Battery life	2.5 - 4 hours	2.5 - 4 hours	2.5 - 3 hours	3 hours

DESKTOP COMPUTERS

DESKTOP SOLUTIONS FROM THE PROFESSIONALS

Desktop A3000

The all purpose RISC based computer with easy to use desktop windows interface. Specification: 4 Mips, 1Mbyte Ram, 800k 3.5" floppy drive, Colour monitor and stand, Stereo sound, enhanced PC-layout keyboard, 3 button mouse. Software included: Edit, Draw, Paint, 1st Word Plus, Genesis multi-media, PC emulator for DOS software, Pacmania game, Education guide, Audio training tape + £100 Software voucher.
Price: £850

Desktop A5000

The next generation high performance computer with expansion capabilities. Specification: 13.5 Mips, 2Mbyte Ram, 40Mbyte Hard-disc, 1.6MB floppy drive, Multi-Sync Colour monitor, Stereo sound, enhanced PC-layout keyboard, 3 button mouse. Software included: Edit, Draw, Paint, 1st Word Plus, Genesis multi-media, PC emulator for DOS software, Pacmania game, Desktop Publisher, Education guide, Audio training tape + £100 Software voucher. Price: £1531

Desktop A540

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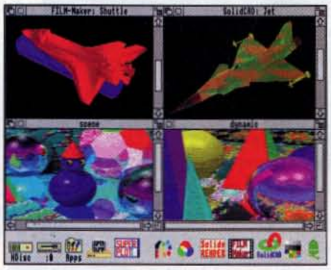
Price: £2799

Desktop CAD


FILM-Maker: Shuttle
SolidCAD: Jet
scene
dynamic
HDisc
:0
Apps

The complete solution for all your conceptual design and draughting requirements. Provides a fully integrated environment for 3D CAD, 2D CAD, Photo-realistic Rendering, Interactive animation, Texture mapping, Programmable animation and high resolution hardcopy to printers and plotters. The system provides 2D & 3D CAD facilities for Architectural, Engineering and Interior design including your choice of desktop computer offering a turnkey solution satisfying all your conceptual, presentation and draughting requirements.

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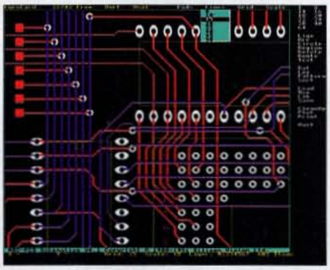
CAD-A3000 £1150, CAD-A5000 £1825, CAD-A540 £2995, CAD AA4FD £1695, CAD-A4HD £1995

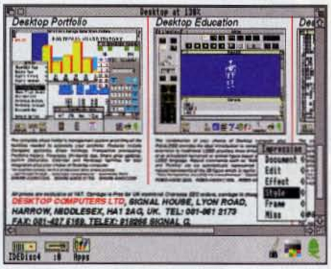
Desktop Electronics



The ultimate Electronic Design Automation package providing both circuit schematic drawing and PCB layout in one design interface for a fully integrated system that surpasses all other PCB design systems in features & speed of operation for the fastest turnaround from concept to finished board design. Features include Schematic & PCB design, Automatic Routing, Multiple layers, Component pulling, On-line Help, Digital/Analogue tracks, Drivers for Printers & Plotters, GerberPLOT, ExcellonDRILL, up to 300,000 components plus your choice of Desktop computer.

"Performs up to professional standards" – BBC Acorn User.
EDA-A3000 £1275, EDA-A5000 £1975, EDA-A540 £3225, EDA-A4FD £1825, EDA-A4HD £2095

Desktop Publishing


Desktop at 130%
Desktop Portfolio
Desktop Education
DESKTOP COMPUTERS LTD, SIGNAL HOUSE, LYON ROAD,
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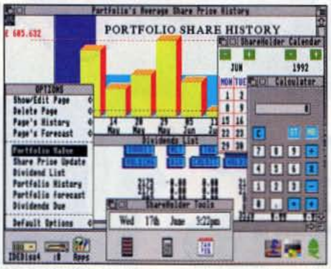
Document
Edit
Effect
Style
Frame
Misc
IDEDisc4
:0
Apps

The leading Desktop Publishing System providing all the facilities needed for word processors, document design and production, page layout, spell checking, hyphenation, automatic contents and index compilation, Flowing graphics with text, Outline fonts for full WYSIWYG display, Auto-page and chapter numbering, Full colour control, Graphics rotation to 1 degree resolution, and supports all RISC OS printer drivers. The Impression DTP package includes all these features plus your choice of Desktop computer. Take the lead for your page designs before your competitors do.

"It is exceedingly easy to use, and produces excellent results" – RISC USER.
DTP-A3000 £975, DTP-A5000 £1675, DTP-A540 £2875, DTP-A4FD £1525, DTP-A4HD £1825

Desktop Portfolio


Portfolio's Average Share Price History
PORTFOLIO SHARE HISTORY
Shareholder Calendar
JUN
1992
Calculator
OPTIONS
Show/Edit Page
Delete Page
Page's History
Page's Forecast
Portfolio Value
Share Price Update
Dividend List
Portfolio History
Portfolio Forecast
Dividends Due
Default Options
Shareholder Tools
Wed 17th June 5:22pm
IDEDisc4
:0
Apps

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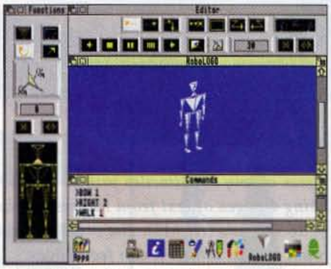
SHR-A3000 £990, SHR-A5000 £1675, SHR-A540 £2875, SHR-A4FD £1545, SHR-A4HD £1845

Desktop Education

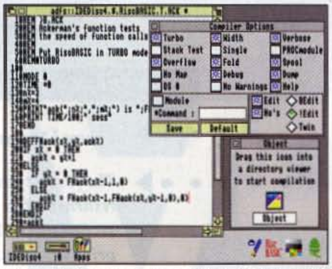

Functions
Editor
RoboLOGO
Commands
Apps
RoboLOGO

```
>BOW 1
>RIGHT 2
>WALK 1
```

The combination of your choice of Desktop computer plus RoboLOGO provides the ideal introduction to computing. This new extension to traditional LOGO provides three dimensional control of an articulated humanoid or animal figure based on the standard LOGO language. Natural commands such as 'Walking', 'Bowing', and 'Picking', etc are automatically represented graphically by natural movements of the 3D figure which is readily understood.

"Takes Turtlegraphics and LOGO into a new dimension" – Educational Computing.
ROBO-A3000 £899, ROBO-A5000 £1599, ROBO-A540 £2849, ROBO-A4FD/A4HD £1450/£1765

Desktop Development


Compiler Options
Turbo
Stack Test
Overflow
No Map
Width
Single
Fold
Debug
No Warnings
Verbose
PROCmodule
Spool
Dump
Help
Module
Save
Default
Object
Drag this icon into a directory viewer to start compilation
Object
IDEDisc4
:0
Apps

The complete software development system for producing sophisticated RISC OS applications. The package includes the unrivalled RiscBASIC compiler allowing you to use the interactive development environment of interpreted BASIC for fast prototyping and interactive testing followed by source code security and machine code performance of final compilation.

"If you are looking for THE compiler to go for, and are confused about which one deserves to win the very public battle that has been raging in the advertisements, well my preference is for RiscBASIC" – RISC USER.
"very useful indeed for development work ... produced significantly more efficient code" – Micro User.
DEV-A3000 £950, DEV-A5000 £1650, DEV-A540 £2899, DEV-A4FD £1499, DEV-A4HD £1799

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Desktop A4 Portable

The power of the A5000 packed into an A4 sized grey-scale LCD portable which can sit neatly on your desktop and versatile enough for outdoor use. Available in two versions: 2Mbyte Ram & 1.6MB Floppy Disc only or 4Mbyte Ram, 1.6MB Floppy, 60MByte hard-disc & the PC-Emulator for DOS. Both versions include a £100 software voucher. Detailed literature available on request..
A4/2 MB/FD £1399, A4/4MB/60MBHD £1699

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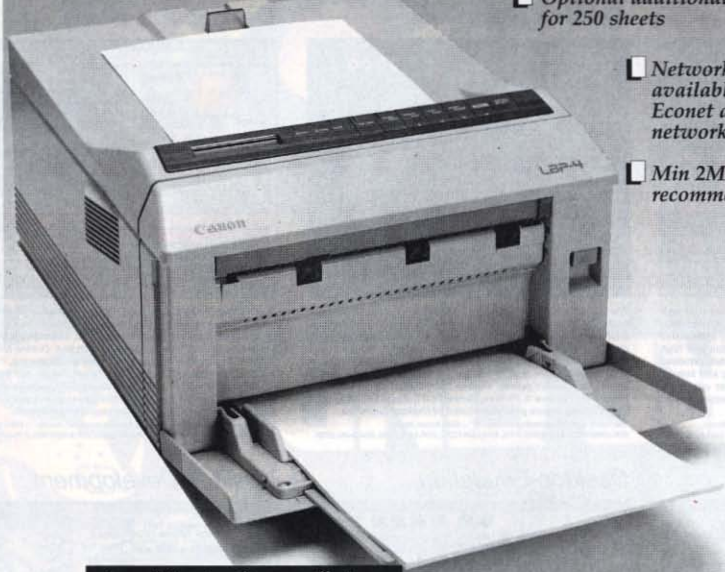

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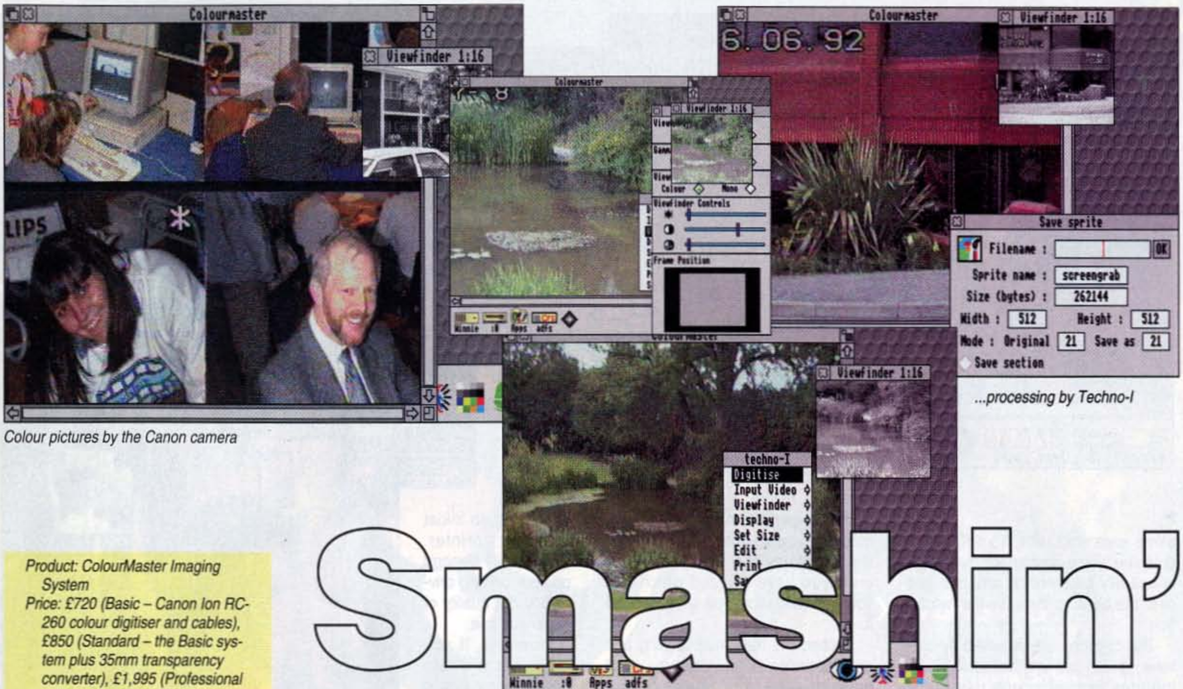


Filename :
Sprite name : screengrab
Size (bytes) : 262144
Width : 512 Height : 512
Mode : Original 21 Save as 21
Save section

Colour pictures by the Canon camera

...processing by Techno-I

Smashin' grabs

Jo Giles looks at two new systems for capturing pictures from real life

Product: ColourMaster Imaging System
Price: £720 (Basic – Canon Ion RC-260 colour digitiser and cables), £850 (Standard – the Basic system plus 35mm transparency converter), £1,995 (Professional – Canon Ion RC-560, colour digitiser, £35 for transparency adaptor, infra-red wireless controller)
Supplier: CSH, 7 Free Church Passage, St Ives, Cambridgeshire PE17 4AY.
Tel: 0480 67945
Requirements: Risc OS

Product: Fotoman
Price: £649.95 (inc. VAT)
Supplier: DT Software, Freepost, Cambridge, CB3 7BR.
Tel: 0223 841099
Requirements: Risc OS

ILLUSTRATING documents on the Archimedes is relatively easy – you can trust to your own drawing skills, use clip art, or grab artwork from the screen. But if you want to capture a particular real-life image you will find yourself picking up a camera.

Now you could dash outside with your trusty 35mm and then scan in the results once printed. Or you could take a look at a still video or digital camera.

You take your snap – some have time-lapse facilities – and the photograph is recorded on disc or in ram. Hook up your Archimedes and transfer the information across.

Let's take a look at the two different approaches.

The Canon approach

Cambridgeshire Software House provide the Canon RC-260 and RC-560 still video cameras to take the shots. The 260 is the system in use in many schools and is a simple point and shoot device which has autofocus, flash, flash interrupt, a macro facility for close-ups, rechargeable batteries and a mains adaptor.

It is very ease to use even for the non-photographer, while the more experienced might like to experiment with the optional telephoto and wide angle lenses. To take your photo just move the main switch to REC and a number one will appear on the display panel.

After you have decided on your picture press the button. If there are any problems – such as forgetting to put the disc in – a red light will flash at you. Take a bad shot and you can erase it. You can opt to have each photo dated too which is useful.

An option for continuous shooting is handy for fast moving objects and there is also a self-timer option. One very nice feature is the interval shot which lets you take time-lapsed photographs for instance.

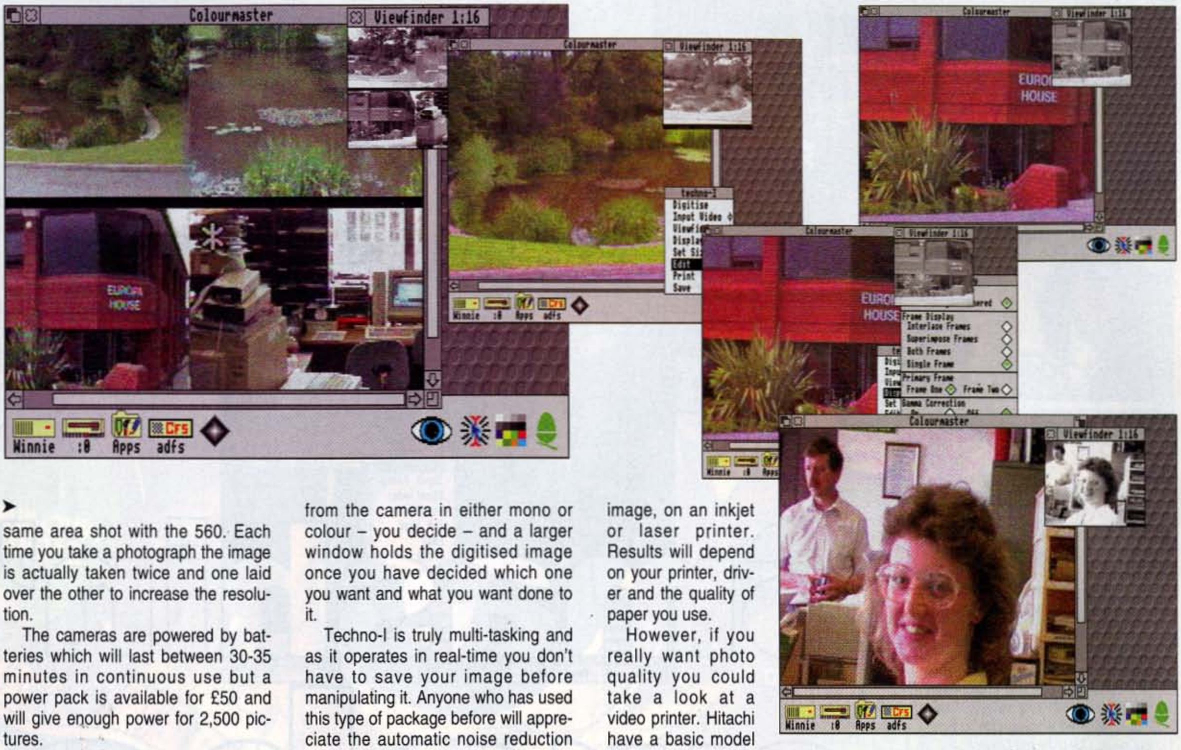
Your handiwork is saved on a 2in disc which is reusable and holds 50 images. An outlay of £5.10 will get you an extra disc. Images are saved as a PAL digital signal which is easily transferred to any machine in the Archimedes range from A3000 to A5000. The system will operate in a 1Mb environment, but at least 2Mb is recommended.

Top of the range

The 560 is the top of the range and its facilities are more in keeping with professional work. The camera is slightly larger but still fits comfortably in one hand and uses the same discs. It has all the facilities of the 260 with the addition of 3 x zoom and wide buttons.

The major difference though is the resolution. I was very pleased with the results of the 260 until I saw the

➤



➤ same area shot with the 560. Each time you take a photograph the image is actually taken twice and one laid over the other to increase the resolution.

The cameras are powered by batteries which will last between 30-35 minutes in continuous use but a power pack is available for £50 and will give enough power for 2,500 pictures.

The ColourMaster systems have an expansion card fitted in the standard way and the software is Techno-I from Technomatic. All the cables you'll need come as standard. Loading the images into the software is simply a matter of connecting the camera to the adapter and card.

You can now port the pictures, manipulate them in Techno-I and save them as sprites for working on in such packages as Revelation or incorporating into a DTP document.

Techno-I digitiser

Techno-I is a real time colour 25-bit video digitiser. It handles colour with 18 bits chrominance controlling the RGB inputs with seven bits – rather than the more usual six – for picture luminance.

The colour information is stored separately so can be used to control contrast, brilliance and gamma correction without affecting the original colour information.

It also provides facilities such as flip, zoom, print or save or even separate in CMYK or RGB formats. A full review can be found in the November 1991 issue of *The Micro User*.

What you see on screen are two windows: One shows the pictures from the camera in either mono or colour – you decide – and a larger window holds the digitised image once you have decided which one you want and what you want done to it.

Techno-I is truly multi-tasking and as it operates in real-time you don't have to save your image before manipulating it. Anyone who has used this type of package before will appreciate the automatic noise reduction and cleaning of the synch part of the incoming signal.

The Professional ColourMaster system which features the RC-560 also comes with a screen splitter as standard. This gives additional control over the editing and presentation.

A remote control unit – similar to ones used with videos – lets you select how many images you want in the picture field – 1, 4 or 25. You can rearrange the picture sequence, access images by track, erase the shots you don't want, turn on the date function and so on and then digitise it.

Once your images are sprites they can be printed as you would any other sprite as a mono or colour image, on an inkjet or laser printer. Results will depend on your printer, driver and the quality of paper you use.

However, if you really want photo quality you could take a look at a video printer. Hitachi have a basic model at around £1,400 and Canon are due to release a £2,230 machine into the UK market which will work on the Archimedes.

Fotoman solutions

From Logitech – who make the Acorn mouse – comes the Fotoman which looks totally unlike any camera you've ever seen. It's a vertical unit which fits comfortably in either hand with a viewing port, flash and main lens which has a screw mount that can accept extra camcorder lenses for close-up and telephoto. The shoot button is in the centre.

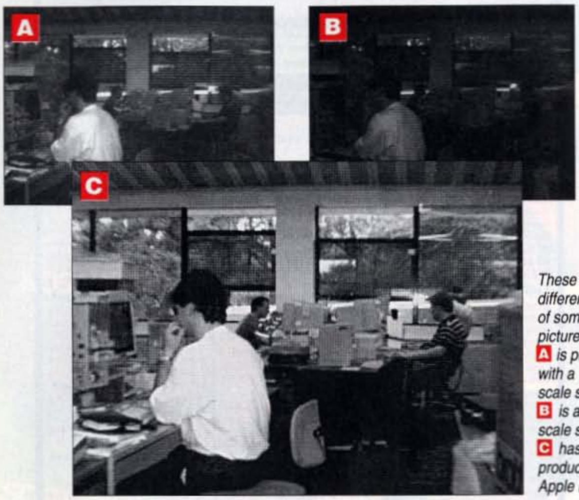
Unlike the Canon the images are held in 2Mb of ram that will take up to 32 black and white pictures at a time – there's nowhere to fit additional memory units. The flash and shutter speeds are automatic and the lens is fixed – without add-ons anything closer than one metre will be out of focus.

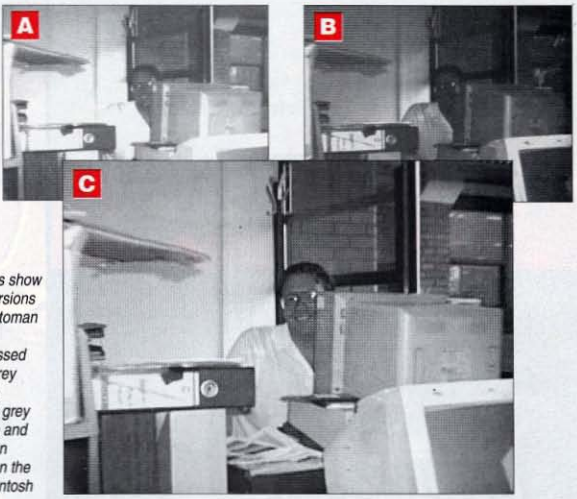
The camera plugs into the serial port of the computer so no special hardware is required, but because of this the downloading time is quite long. The package from DT Software will interface the camera with the A5000 and A4 portable which have an identical serial port to the PC.

A special adapter is needed for the A3000, A300, A400 series and A540

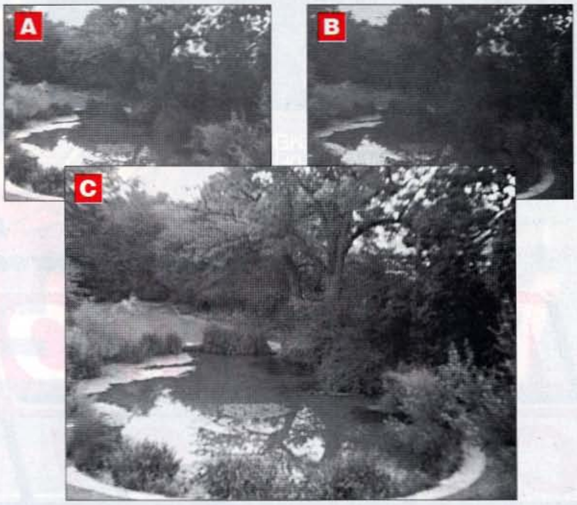
Fotoman interior with flash...

...and a cloudy day exterior





These shots show different versions of some Fotoman pictures.
A *is processed with a 16 grey scale sprite*
B *is a 256 grey scale sprite and*
C *has been produced on the Apple Macintosh*



while the A3000 will also need its serial port chips fitted. Essentially the Fotoman is a true computer peripheral – it can't be used without a computer – while the Canon Ion plugs into a computer if that's what you want.

Software control

There are no fancy attachments with this system – when you press the button it takes the picture, no more, no less. But it can be made to take a snap under software control so you can shoot from either the main package using an option on the iconbar menu or invoke a special snapshot utility to take a frame.

For example the Risc OS 3 !Alarm program has the ability to run a program at a specific time. This could be the snapshot utility, so timed shots are available with a lot of software support.

The camera seems to need to be on permanent recharge. It takes six hours to charge up from when you buy it and the software will then tell you that it's on about 97 per cent charge. After taking nine shots, five with flash, it was down to 86 per cent.

Without taking any further shots it maintained this level, but when you consider that it takes 32 pictures you can see how fast the power drains. Unlike a still video disc, power is needed to keep the picture once it's been taken, so it is a high priority to get it transferred to a computer.

The Fotoman manual suggests having a car lighter adapter so you can use it in the field and maintain the power level. This is probably a good idea if you intend to use it away from a mains power source.

Inside the Fotoman a rom of basic upload software must be supplemented by additional software transferred from the host computer. The upload must be performed before pictures can be taken and downloaded. If the battery in the camera goes flat the software is lost.

This method has the slight advantage that if an enhancement to the software is produced it can replace what's currently being used. However I suspect an upgrade is unlikely given the limited quality of the results. A new camera is more likely.

The limitations of the camera are compensated to some extent by the software. The !Fotoman application by DT Software allows manipulation of the raw data files from the camera.

Downloads

Two forms of download are available: Thumbnail and Full. A Thumbnail image is short – only about 16k – and takes about five seconds to transfer. The Full image is 90k taking over a minute.

What's transferred is the raw 256 grey level image as shot by the camera. This is held in memory while the software applies translation to sprite form. The translation parameters used can be altered although they're not as extensive as the Techno-I options.

You can sharpen up a mushy picture and what can initially appear as a grey blob can be forced to reveal details.

Images can be displayed in 2, 4, 16 or 256 shades of grey and in the last format they save as Clear files rather than sprites.

From Clear you can use the PD software !Creator to convert to TIFF then perhaps use the powerful !ChangeFSI from Acorn to render it back into sprite form. It may seem a long slog but with Risc OS it's a lot easier than using with a PC for which the system was originally designed.

Image processing, through whatever system you choose, can go a long way to restoring a poor image but it doesn't really make up for the fact that you have almost no control over the picture taken.

Summing up

For schools the Fotoman is quick and easy – though the hardware/software link is a little temperamental – and it's lower priced than the Canon. But bearing in mind the Ion camera is colour and you don't lose pictures when the battery goes flat perhaps the price difference isn't so important.

In the long run it's horses for courses – if you need professional quality and colour the Canon Ion is the only choice. But if you want ease of use, low cost and colour isn't necessary the Fotoman is worth a look.

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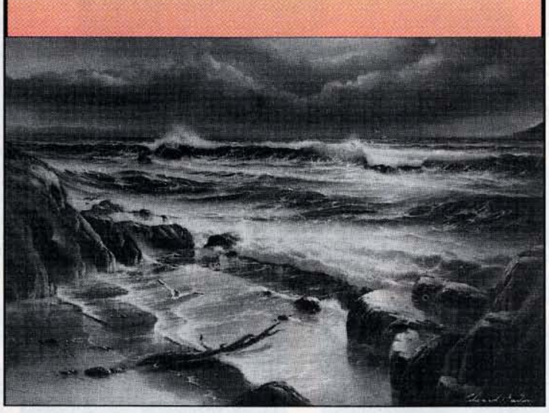

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Digitisers

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HCCS Vision digitiser	£45.99 b
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50 with labels	£32.00 a
100 with labels	£63.00 b

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- The cost is 40p per word, with a minimum of 10 words.
- **WE GUARANTEE your ad will appear in the next available issue of *The Micro User*.**

EDUCATION Update

Pigs to rain forests

THERE'S no stopping Sherston Software this month with releases for both the BBC and Archimedes ranges. First out of the sack is **The Three Little Pigs at Home**. Priced at £25 this is a topic based package aimed at infants,

It's full of activities based on the classic story of huffing and puffing. The first part follows the traditional story and presents numerous maths and language activities as they help the Three Little Pigs build their houses of straw, sticks and bricks. What of the wolf? Well he is around and he lands in trouble when he climbs down the chimney.

Two Peek-a-boo programs retail at £21.50 each. **Peek-a-boo Around Our House** gives young children the chance to take their very own trip into the exciting world of Peek-a-boo. It is full of all sorts of magical objects and events just waiting for young infants to discover as they explore inside and outside the house.

Each scene has several activities concealed in it and to find them children move the arrow keys to where they want to peek-a-boo. There are animated nursery rhymes, games and activities to find in this first in a new series of infant discovery packs.

Peek-a-boo at Opposites with Goldilocks and the Three Bears is the second in this series. It provides children with language activities as they join his intrepid foursome. The software follows the usual storyline and children can explore each scene to see how many opposites are hidden in the picture.

For Archimedes users **The Crystal Rain Forest** is Sherston's first full educational adventure and it costs £35. It's a classic Simon Hosler creation full of humour, puzzles and problems. The graphics take full advantage of the Archimedes.

The setting is the planet Oglo whose last rain forest is disappearing as the Cut and Run Saw Mill Gang hack their way through. Naturally the king is upset by the destruction and has banned all felling. But poisoned by the unscrupulous Gang he now lies in hospital. It is down to the children to save the day.

The adventure is intended to be both a starting point for conservation and nature work as well as a fun way to teach Logo. All the puzzles and problems encountered are related to Logo and presented in a carefully structured manner so children learn the language without realising it.

The CD Story

CUMANA (0483 503121) have published their latest CD-Rom Portfolio for Education which is a no-nonsense guide to CD-Rom discs of special interest to both primary and secondary schools.

Take your pick of CD-Roms

The portfolio is designed to help in the search for good CD-Rom software and includes over 40 titles suitable for 9-18 year olds. It also gives a brief introduction to CD-Rom terms, applications and technology.

MD, John Simnett, commented: "By building the range on two themes, titles that have educational merit and those published in the UK, Cumana hope to encourage the growth of home produced educational software relevant to the National Curriculum."

MoRRRe

TEN out of Ten is a new range of educational software from Triple R Education (0742 700661) for the Archimedes. Aimed at both home and school, the first of the series is Mathematics – Number.

It comes on two discs and costs £25.99. Six educational games cover 36 specific topics from Attainment Target 2, recording progress as you go in two ways.

The Achievement chart not only tells both child and adult the topics covered by a specific game, but it also lets them know how a particular child is doing.

The chart starts black and moves through red, yellow, green and blue recording how each child improves. The High Score Tables take into account the game elements such as speed and bonuses.

The games have been designed in consultation with teachers and aim to cover practical as well as academic problems. They all have six built-in grades each aiming at a higher Attainment Target, but progress to Grade two can't be made until you've managed at least 50 per cent in Grade one.

The details of 64 children can be kept on the Achievement Chart and certain options are set by the parent or teacher such as different graphics for different age groups, sound, passwords and when to show details of the attainment targets.

Carnival, Cover Up, Bang, Grab It, Silicon Brain and Cheers cover everything from simple addition to fractions, powers and percentages in a fun and challenging way. Good use of graphics and rewards – you even get a certificate at the end – make it suitable for home or school.

Braille maker

THE recently-opened Dorton IT Support Centre (0732 63187) have released a piece of software designed to help teachers and support staff of the visually impaired.

They have developed the first comprehensive Text-to-Braille translation program written specifically for the Archimedes. The program will accept any Ascii text file and will convert to a fully contracted Grade 2 Braille file which can be output to suitable braille printers.

You can also customise the braille output to provide features such as grade changes and capital signs. When the program has been loaded a text file is simply dragged to the icon bar icon and a braille file is created which in turn is just dragged to the same icon.

The cost of the Text-to-Braille translator is £25.

The Concept and the Somme

THE Battle of the Somme has been developed by Alastair Wells, the head of IT at Netherhall School in Cambridge. This multimedia package runs on the Archimedes and aims to help pupils gain an understanding of the events which occurred around July 1, 1916.

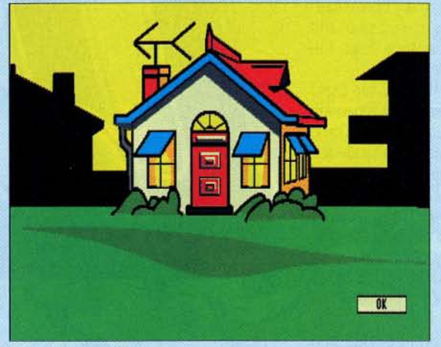
The package offers text, sound, graphics, photographs, databases, maps, laservision stills and moving sequences many provided by the Imperial War Museum. The Concept Keyboard has become an integral part of the software as it enhances its interactive nature.

Alastair Wells remarked: "The way in which the Concept Keyboard is used in the Battle of the Somme demonstrates that it has far greater potential than being limited to special needs applications".

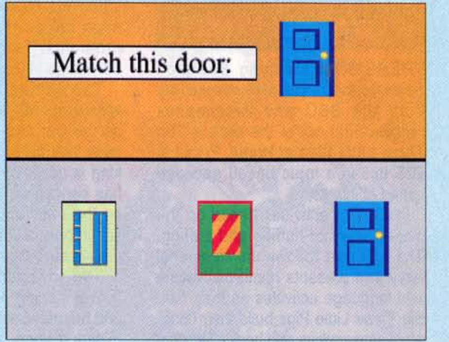
Three Concept Keyboard overlays are available, although the keyboard can be used to access all areas of the package in multiple layers. Oak Solution's Genesis II was used to create the network of interlinked pathways used in The Battle of the Somme which is now available.

As well as the software, worksheets support its use in history, English, maths, geography, music and art National Curriculum activities and projects. An NCET-funded booklet is also included and the whole package including laservision disc cost £125.

Product: Detect-A-Pet
Price: £49.50
Supplier: ESM, Abbeygate House,
East Road, Cambridge CB1 1DB.
Tel: 0223 65445
Requirements: Risc OS



Home sweet home


Match this door:

You've no key, so match the door to get inside

Down und

ONCE, and only once, we were asked to look after a neighbour's pet – a hamster. We were not asked a second time because we lost it. Memories of the search and its aftermath were starting to fade but reviewing Detect-A-Pet has brought them all back.

Published by ESM and originating from the Department of Education in Queensland, Australia, Detect-A-Pet is a substantial software package based on the search for a missing pet. The package has four major components: The software, the teacher's guide, a story book and a game board, all of which are very impressive.

The teacher's guide makes it abundantly clear that the materials represent an integrated approach to learning. The software is merely a part of that approach and should be regarded as a stimulus rather than an end in itself.

In fact in some respects the software is secondary to the teacher's guide which is a treasure trove of ideas using headings like reading, writing, science, drama, listening, art and craft, social studies, music, health, physical education, maths and much more.

Within the guide these headings are combined to provide thematic work based on Pets or Our Neighbourhood. Activities are suggested for individuals, groups or whole classes and are, on the whole, of good quality as are the 18 pages of photocopiable masters again providing a useful resource.

Produced in Australia, the package has not been re-written for our part of the world and so contains quite a few antipodean references – dollars and cents rather than pounds and pence and pictures of strange post boxes for example. Mrs Mangel fails to put in an appearance, thank goodness.

The software installs itself on the icon bar and is fully multi-tasking. Opening the first window gives a clue on what to expect. The graphics are uncomplicated, bright and bold – really inviting for the target audience of 4 to 8 year olds.

The language, too, is very simple: Throughout it has deliberately been kept to a carefully controlled minimum and details of all the words used are given in the teacher's guide in an attempt to make sure it is introduced naturally.

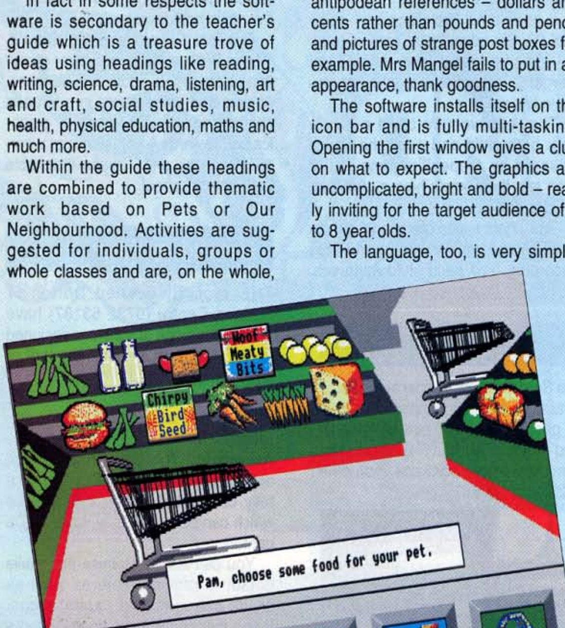
Clicking on OK on the first screen and then entering either an individual or group name places you in front of Home. Further clicks moves you nearer to the front door until finally, after matching a picture of the door with three alternatives, you're in. Unusually, in England at least, a bedroom lies just inside.

At the bottom of this screen are five large icons which are common throughout the adventure. Clicking on the first gives you an eye which reveals objects not initially visible – something which needs to be done on arrival at any new location. The second icon gives you a pair of feet, enveloped by training shoes, used to move to another location.

The remaining icons, two of them hands, one taking and the other dropping, and the fifth one, a handbag, control objects and clues which may or may not be useful.

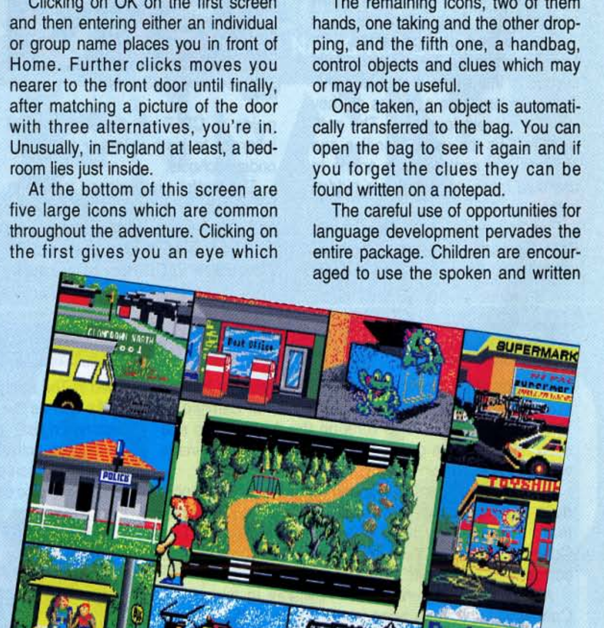
Once taken, an object is automatically transferred to the bag. You can open the bag to see it again and if you forget the clues they can be found written on a notepad.

The careful use of opportunities for language development pervades the entire package. Children are encouraged to use the spoken and written

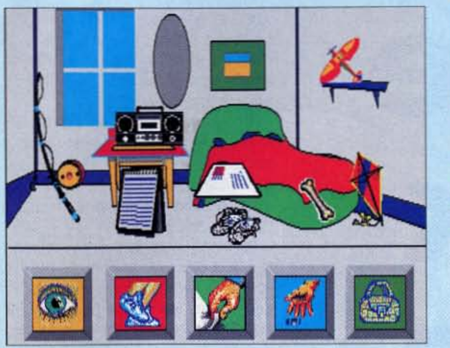


Pam, choose some food for your pet.

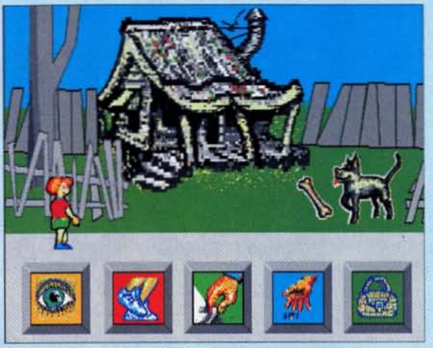
Pets don't understand about missed mealtimes



Record where you have been on the game board



First call, your bedroom



Do you want to give or take the bone?

Frank Jukes joins the sleuth trail on an antipodean adventure

er detectives

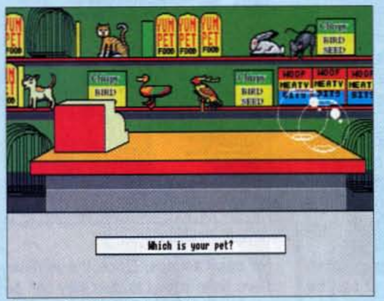
word in a wide range of circumstances – simply reading from the screen is not enough.

Children are encouraged to discuss and describe what they are experiencing both orally and in writing. Work involving a variety of other media is also suggested.

Tape recordings of pet sounds, for example, could be used as an extension of work done at one of the locations while the classified ads sections of newspapers are seen as sources of further raw material.

Even the accompanying story book, *Something Very Special*, is presented as not only a reading resource and introduction to the program, but also as an example of a particular type of book which can be an item for discussion and learning in its own right.

As the children move around the program's 12 locations they are able to use the game board to record where they have been and what they have discovered.



Which is your pet?

Can you find the missing pet?

Slips of paper placed in the various locations can be used to remind themselves of clues found and objects taken or dropped. At a very simple level, counters can be left to mark locations visited.

For the busy teacher there is a complete description of each location, a copy of all the text which may appear on screen and details of what tasks need to be performed at each place.

These tasks are varied and involve reading for information, the development of hand-eye coordination and word-picture matching among others. Unfortunately, individual tasks do not change a great deal between different attempts to find the pet.

The various locations are interesting and give plenty of opportunity for language development. Moving between them to search the neighbourhood is accomplished by clicking on arrows in the direction of the movement required.

Once at a particular location clicking on OK initiates the problem solving. Success in solving the various problems provides help in finding the lost pet.

However, unsuccessful attempts can result in the child being unceremoniously dumped out of the program. Not very friendly or helpful.

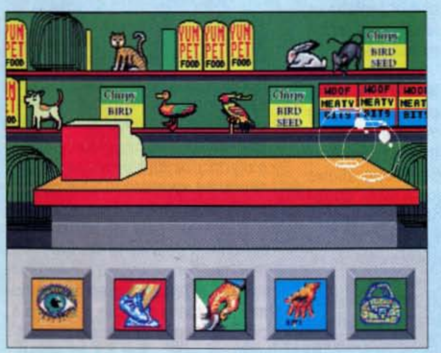
Similarly, some of the manoeuvres needed to complete a screen are quite difficult to achieve – it took me ages to use the key to let my pet out of its cage. The youngest children will certainly struggle in one or two locations unless adult help is available.

To compensate for this it is possible for pupils to save their present position. As well as providing thinking time this option also helps the teacher with organisation and makes sure that work away from the computer can go on in parallel.

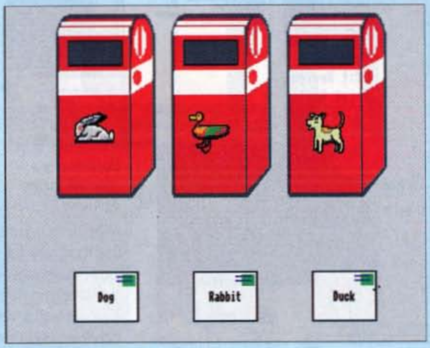
Summing up

This is a very well thought out package with a sound educational philosophy. Both the teacher's guide and the program are impressive and useful resources in themselves and coupled with the story book and board game, Detect-A-Pet provides a wealth of experiences for infant and lower junior classes.

Problems are few with almost all connected with the package's roots. However, while some teachers will regret that the publishers have not removed the more obvious Australian references, I am sure that just as many will be able to turn this problem into a feature. G'day!



The five icons give you game control



There are some tricky puzzles to solve

Product: Bookstore
Price: £39.50 (£59.75 licensed user)
Supplier: ESM, Abbeygate House,
East Road, Cambridge CB1 1DB.
Tel: 0223 65445
Requirements: Risc OS

In the book store

A new piece of software with a literary bent comes under Ian Dickenson's critical gaze

BOOKSTORE is principally a reviews database which aims to encourage children to write book reviews and help teachers manage reading activities.

It is simple in concept, but how useful will it be in practical terms?

The samples folder provided is only meant to get you up and running quickly, mainly a facility to find out how to operate Bookstore without having to type in lots of reviews. Dragging it over the Bookstore icon opens the sample set of reviews.

In practice, these provided a good introduction both for myself and the children who used it, allowing us to see the potential of Bookstore before we created our own work.

As a result of intense negotiations with a colleague from the English department it was decided that the software could be used by a third year group in the process of evaluating Macbeth. Pupils were not all at the same point in the study, which was good for computer congestion.

As part of the study of Macbeth, pupils were encouraged to appraise the play. This can be a difficult task for children, even when guided by the expertise of the teacher.

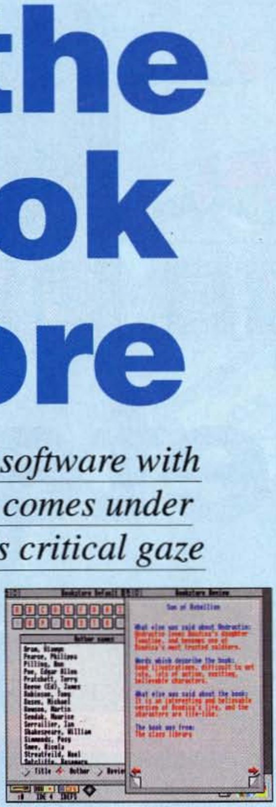
However, Bookstore encourages a very structured approach to book appraisal. The program is designed so that it is quick and easy to use, allowing the storage and retrieval of information that pupils have created.

The sections to be filled in are straightforward. Some need options to be selected by simply clicking on the relevant button, others require a response which will involve keyboard input.

When a review is created the pupil has to pass through a total of 11 screens. Though this sounds a lot, in reality it was simple and quick. It is also possible to go back to a previous pages to change any information.

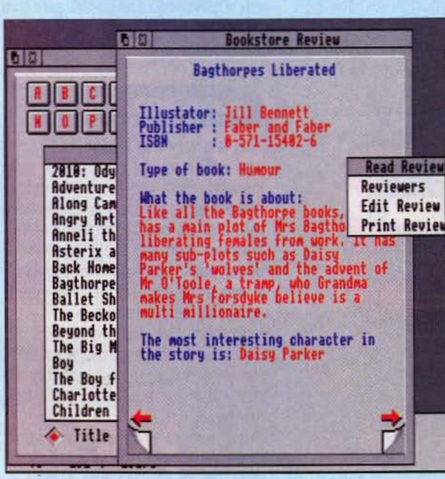
When the review is complete it can be used in several ways. It can be read on screen or printed copies can be obtained to use in displays, projects, and so on.

Eventually many reviews will build up and can be grouped into classes for easy access. Once the reviews have been saved to disc they can be accessed in a variety of ways: Title, Author, Reviewer and Type.



Structure is encouraged

Listing by reviewer appeared to be the most popular as pupils liked to see their classmates names listed on the screen, as well as their own, giving them a sense of ownership.



Bookstore Review

Bagthorpes Liberated

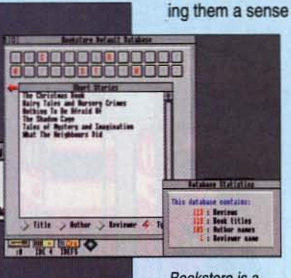
Illustator: Jill Bennett
Publisher : Faber and Faber
ISBN : 0-571-15402-6

Type of book: Humour

What the book is about:
Like all the Bagthorpe books, has a main plot of Mrs Bagtho liberating females from work. It has many sub-plots such as Daisy Parker's 'wolves' and the advent of Mr O'Toole, a tramp, who Grandma makes Mrs Forsdyke believe is a multi millionaire.

The most interesting character in the story is: Daisy Parker

Cross referencing is simple



Bookstore is a very specialised database

The whole process of selecting items in Bookstore is done via the use of buttons or listed items, which makes it easy.

The data is collated into a series of pages that form the final review. In this manner, Bookstore allows for a very structured approach to reviewing literature and yet still has the flexibility for the reviewers' opinions and thoughts.

Searching through a list is intuitive. You use the vertical scroll bar to move up and down or click on a letter of the alphabet displayed on screen. The list will then display from the selected letter onwards. There is even a find option that will search for words as well as other features to rename and delete.

Bookstore can be used with virtually any age group from primary to secondary because of its ease of use. Statistical information tells you how many reviews, titles and authors are held in a database.

As classes create their reviews the teacher can pass them on to the library to be used by other children and so they too get the benefit of the work that another pupils have put into the review.

However, the best use of Bookstore is when it is used as one of many activities, as it is not intended to be the sole focus for the lesson.

The documentation is concise, compact and easy to follow. This has much to do with the fact that the software is very straightforward.

However, any niggly problem is only a phone call away as ESM's telephone support is excellent and reassuring. Special thanks go to Owen Love. Not only did he answer my technical questions but also assured me that other users of the software would get similar treatment.

The software would be useful to any school, but how could it fit into the National Curriculum?

The documentation devotes two pages to explaining how Bookstore can be integrated to NC needs of English. It can be used to address Attainment Target 2 – reading, level 3.

Also, levels 4 and 6 are catered for. The program also helps the implementation of level 7 iv to 10 iv and reflects the needs stated in programs of study for key stage 2.

All this is great stuff and directly applicable to everyday classroom requirements. However, it should be stated that Bookstore can easily be used outside the NC to encourage and record pupils work in this area.

Summing up

Bookstore is an application that can easily and appropriately fit into classroom activities concerning English and library projects. It is easy to use and provides a very structured approach to what can be a difficult subject.

Used as part of an overall scheme it proved to be a strong motivator for pupils and allowed the teacher a larger degree of control and monitoring of pupils work. It is a practical piece of classroom software.

Product: Sparkle
Price: £59
Supplier: Morley Electronics,
Morley House, West Chirton,
North Shields, Tyne and Wear
NE29 7TY.
Tel: 091-257 6355
Requirements: Risc OS

Twinkle, twinkle...

Rog Frost and Phil Tayler add some sparkle to their lives

SPARKLE falls into the category of Control software. While it can do a great deal on screen, to use it fully a user port, analogue port and appropriate interface and buffer box are needed. Supported interfaces include Deltronics and those which connect to the user and printer ports.

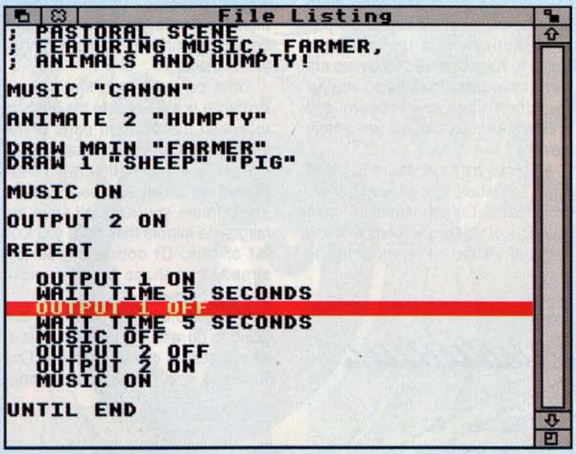
A separate version of the software is available to work with the Lego Dacta system. As well as this collection of hardware, a set of input and output devices will also be needed.

These include switches and light sensors, buzzers, motors and bulbs. Such items can be self assembled but the makers of interfaces sell them with the required plugs already attached.

Putting together all that gear costs a lot of money so it is not for the faint hearted. Schools, of course, have a statutory requirement to allow pupils to experience control technology at all levels from infants upwards.

It is an area in which many schools have always found a problem and such establishments must address the situation rapidly.

They could, thus, be interested in Sparkle, as could the hobbyist who enjoys poking wires into the back of the computer to make things happen. The question such people must consider is whether Sparkle meets their needs.



```
; PASTORAL SCENE
; FEATURING MUSIC, FARMER,
; ANIMALS AND HUMPTY!

MUSIC "CANON"

ANIMATE 2 "HUMPTY"

DRAW MAIN "FARMER"
DRAW 1 "SHEEP" "PIG"

MUSIC ON

OUTPUT 2 ON

REPEAT

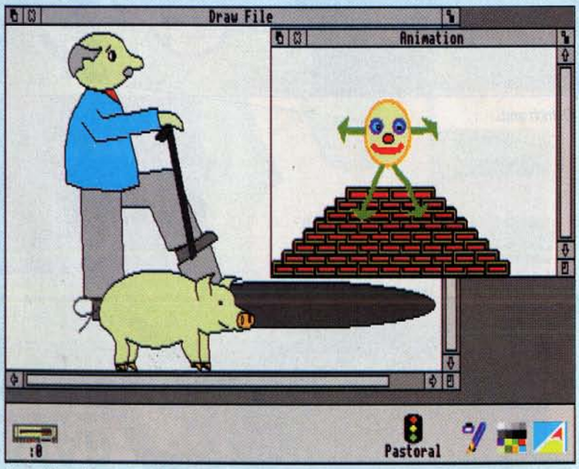
  OUTPUT 1 ON
  WAIT TIME 5 SECONDS
  OUTPUT 1 OFF
  WAIT TIME 5 SECONDS
  MUSIC OFF
  OUTPUT 2 OFF
  OUTPUT 2 ON
  MUSIC ON

UNTIL END
```

Use Basic or the comprehensive built-in language

For many Archimedes programs a manual is not required. They all follow similar formats and it is easy to guess at what to do.

Control software, though, is different. Most of us are nervous when connecting things up to the faithful computer and we need re-assurance. That is why looking at the manual first is imperative.



Merge drawfiles to create animations

It should be good and easy-to-read, but Sparkle lets us down in this area. It is woefully lacking in explanations of what it does, how and why. It gives poor advice on technical matters such as backing up the disc.

The Lego version handbook seems to have been written with the user in mind as it is much more readable but only covers areas where using Lego is different to using other interfaces.

Sparkle comes with a selection of demo programs and even a cursory look at these will tell you it is really rather clever.

It can load standard drawfiles and merge them to provide a very basic animation. For better animations, files from Euclid or Tween can be used.

The program can run Tracker music pieces and – subject to computer memory – all these effects can occur at the same time.

The on-screen display can get a bit cluttered. Apart from drawfiles and animations, your program listing is displayed – along with a highlight to show which line is implemented.

You can access the state of the input switches and output devices as well as see in which direction the motors are running.

It is possible to run a control program without connecting anything to the computer. This is because the function keys can be used as the input switches – an idea which other control software writers might use.

You can see simple commands being carried out. For example, OUTPUT 2 ON or WAIT 10 SECONDS or even MOTOR 1 BACKWARDS.

Using any standard text editor you can write a sequence of events using sensible English commands. Every Archimedes user has one since Edit is supplied on the Applications disc. A 1Mb basic machine has sufficient memory to run Sparkle and Edit at the same time.

If you're an old hand when it comes to Basic programming, commands like Repeat/Until, While/Endwhile and For/Next will be second nature and you'll soon be putting together some interesting sequences to produce an all music, all flashing, all screen animated display.

More advanced users could try a bit of logic with And, Or and Eor while checking for conditions with the If/Then/Else commands. In fact, Sparkle provides a comprehensive programming language for controlling events on and off the screen.

But what about year 9 (14-year-old) pupils on a Friday afternoon? How many would cope with the language level required, or with the need to run two programs at once?

How many would end up smashing the computers in frustration? Well, probably not many would actually turn to violence, but my guess is that only the brightest 20 per cent would get a lot out of it.

Summing up

Sparkle is not a general program for schools. No doubt some of the brightest pupils would cope well with the complexities and such pupils will love it.

As a fun program for enthusiasts, it is a great. To make full use of it, though, you would need all that extra hardware and additional software.

Mirror, mirror on t

Mike Cook reflects on some distorted images

THE whole point about Body Building projects is that you add something extra to your computer. Usually this is electrical, but occasionally we have a look at a *not so obvious* add-on. This month is such an occasion as we are going to use a polished Coke tin.

I would like to explore the topic of Anamorphic art, in which a seemingly incomprehensible picture is rendered normal when viewed through a cylindrical mirror. This I believe first came into prominence with the Jacobites, where no mention of the King was allowed.

To keep up their allegiance they devised designs that looked quite abstract but when viewed in the polished surface of a tankard gave praise to King Charles. Today we are much more used to distorted images so I don't think any modern day roundheads would be so easily fooled.

A normal mirror is flat, it is called plain, and when light strikes it, it will be reflected. Do you remember from your school science lessons that the angle of incidence is equal to the angle of reflection? This means that a plane mirror forms a virtual image behind its surface. That's why they are so useful.

On a curved mirror, the angle of incidence is still equal to the angle of reflection but different parts of the image reflect off different parts of the mirror. This means that any image formed will be distorted, see Figure I.

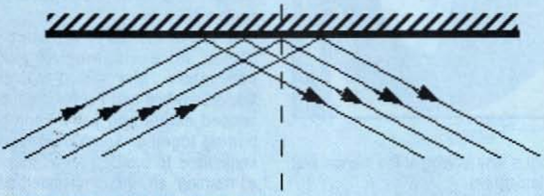
I am sure you have all seen the fairground mirrors that make you look fat or thin. Of course if you are already that shape they can make you look normal.

In principle that's what we are going to do with our cylinder. First of all you need a cylindrical mirror. One way is to strip the paint off a drinks can with paint stripper and then polish it up to a good shine. If you have access to a buffing wheel you can make a quite good job of it.

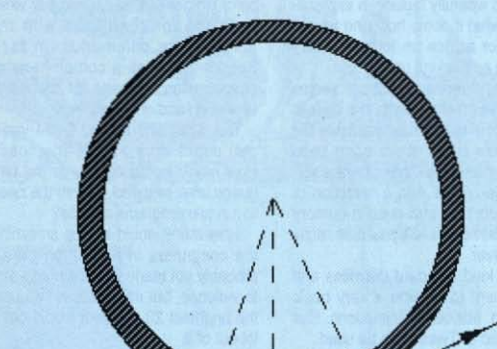
Alternatively you can use aluminium coated plastic – you can even get cylinders of this from specialised publications. One I used and that provided inspiration for this month's article is *The Magic Cylinder Book* from Tarquin Publications, Stadbroke, Diss, Norfolk IP21 5JP.

Plotting the transformation

What we have to do is to model the distortion that takes place in the cylinder and mimic it on the computer. The technical name for distorting an image is *transformation* and to turn it back to its original form we use an

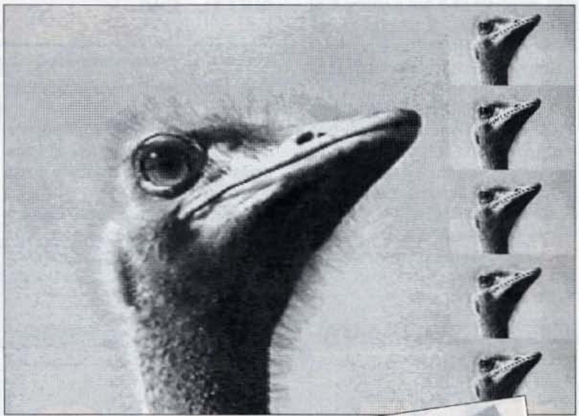


Parallel rays reflecting from a plain mirror

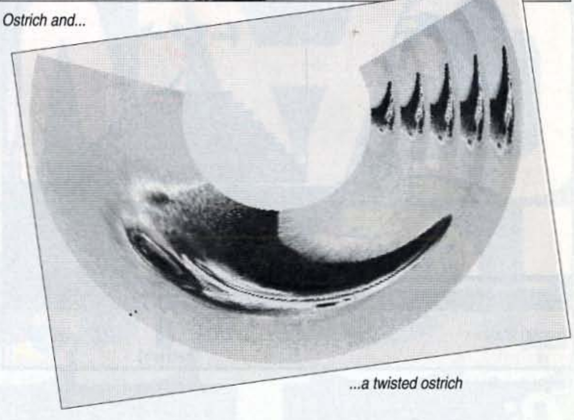


Parallel rays reflecting from a curved mirror

Figure I: The effect of two different reflecting surfaces on parallel rays



Ostrich and...



...a twisted ostrich

he wall...

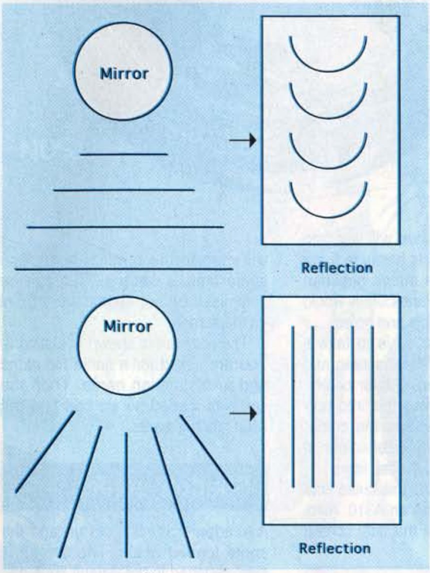


Figure II: How straight lines are converted by a cylindrical mirror

inverse transformation.

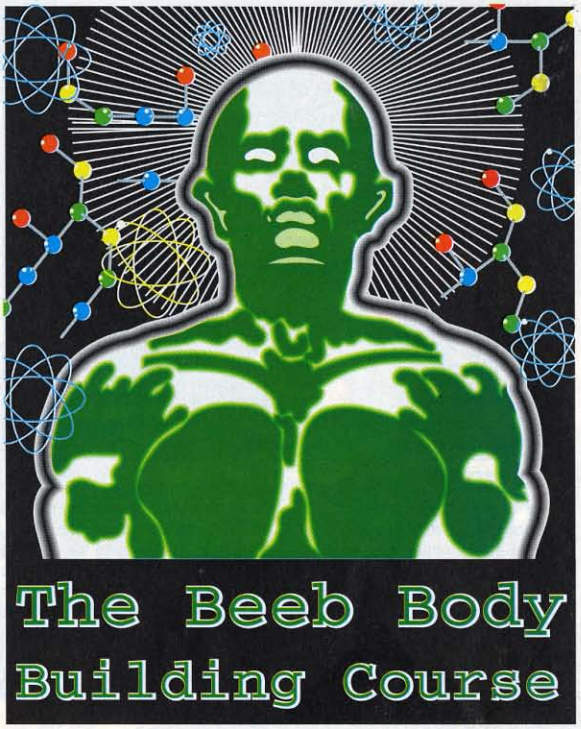
This sounds rather grand but all we do really is subject the coordinates of a picture to a few mathematical processes – the clever bit is knowing which processes.

Let's see what a cylinder will do to some straight lines – Figure II. Horizontal lines are converted into arcs and radial lines are converted into vertical lines.

Therefore, to transform the X component of a point we have to treat it as if it was an angle on a polar coordinate plane.

Similarly, to transform the Y component we have to pretend it is the radius on a polar coordinate plane. In addition, as there is a mirror, and mirrors invert, we have to apply an additional inversion to the Y coordinate. Having expressed our transformed point in polar coordinates we have to turn it back into Cartesian coordinates so we can plot it on the screen.

To draw a line, we can't just transform the start and end points and connect them up. We must transform every point along the line. In practice if we split the line up into enough segments we can join them with straight lines. This is what happens in Listing I, which can be run on any Acorn computer and provides a template for your own designs.


The Beeb Body Building Course

Running the program

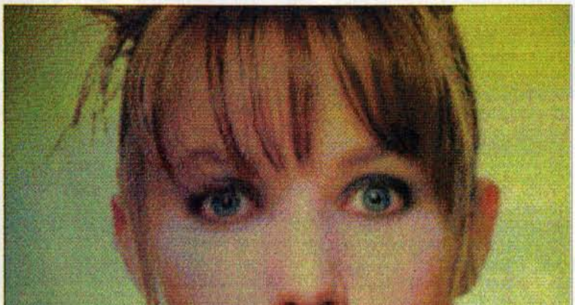
When run it you can request a grid, design or picture and illustrate three different ways of drawing on a computer screen.

You are then asked if you want it to be normal or in the transformed form.

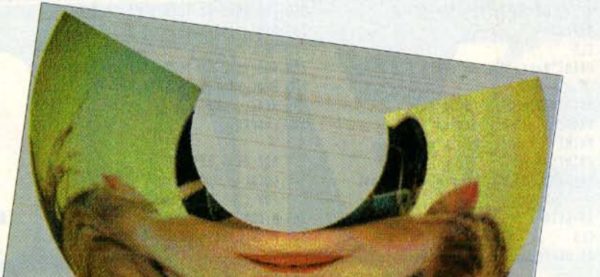
The normal form is useful to see if you have got the picture right. When you request the Magic Mirror transformed format, a distorted version of the image will be formed along with a circle.

You can then place your cylindrical mirror on the circle to view the correct image. If you tend to get embarrassed holding up a polished drinks can to the screen and squinting up at it, get yourself a screen dump utility for

➤

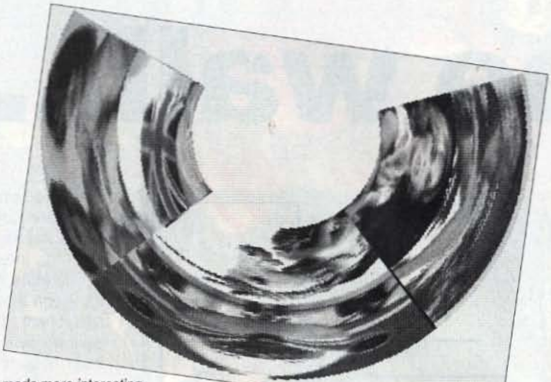


Picture this...



...but you'll need a mirror for this

An interesting montage...



...made more interesting

more portable and relaxed viewing.

There are two basic procedures, one at line 540 which will draw a line and the other at 650 to draw a circle. Both are passed a parameter that will determine whether to draw the points normally or to transform them first. The actual transformation takes place in PROC_MAGIC starting at line 750.

If you want to save your fingers, stop at line 860, which is the data for the picture. The picture is a series of points to connect up with a straight line. Younger readers will recognise Johnny Yellow Hat.

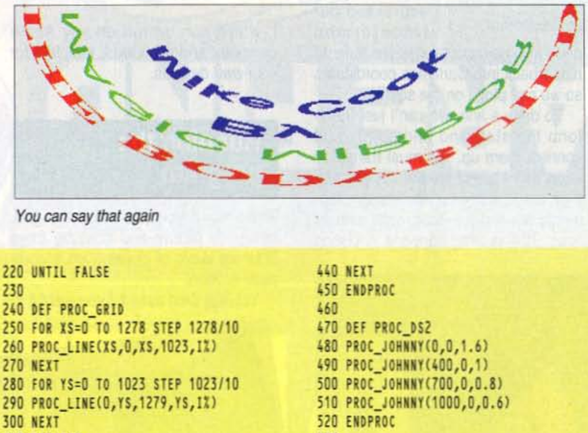
This is just the start. You can write all sorts of drawing routines and by using the two procedures here you can produce your own Magic Mirror drawings.

However, for those of you with the 32-bit computers, or a Master and lots of patience, we can go one better. Instead of transforming the drawing commands we can take a whole screen and convert this into a Magic Mirror screen. It can be from Paint, a drawing program or from a video digitiser.

If we take each point on the normal screen and then convert it to our Magic Mirror plane we will run into some difficulty. This is because there is not a one-to-one match between points on the two planes. This would lead to duplicate points and holes.

What we need to do is to take a point on the Magic Mirror screen and convert this into Magic Mirror coordinates. By transforming this into normal coordinates you see the colour pixel. Finally plot that pixel colour at the original point you started from.

As you can imagine this takes time – about 15 minutes on an A310. Also, not all the points on the final screen will map to the original screen so some time is wasted. This can be minimised by not taking every point on the screen.



You can say that again

The program is shown in Listing II. You are asked for a sprite file name and a destination name. Then the sprite is loaded so we can find out what mode it wants.

Shadow screen

A shadow screen is set up and the sprite loaded again. The screen is then switched to the default bank and the work begins. Finally, the Magic Mirror screen is saved to disc using the file name you put in at the start.

You will see from the listing that quite a bit of maths is going on. The biggest problem is getting the inverse tangent of the angle as the ATN function can only give an ambiguous quadrant.

When you have finished you might

```
   10 REM>Mirror.Magic1
   20 MODE 0
   30 SC=.6
   40 YF1=0.62*1024:YF2=.38*1024
   50 REPEAT
   60 CLS
   70 PRINT"Magic Mirror":PRINT"By Mike
Cook"
   80 PRINT:PRINT"1 - For a Grid"
   90 PRINT"2 - For a design"
  100 PRINT"3 - For a picture"
  110 PRINT:D$=GET$:PRINT
  120 PRINT"M for Magic or N for Normal
? ";
  130 A$=GET$
  140 CLS
  150 IF A$="M" OR A$="m" THEN I%=1 ELSE
 I%=0
  160 IF I%=1 THEN PROC_CIR(640,740,0.35
*512,0)
  170 IF D$="1" THEN PROC_GRID
  180 IF D$="2" THEN PROC_DS1
  190 IF D$="3" THEN PROC_DS2
  200 PRINTTAB(0,31)"Space to continue";
  210 D$=GET$
  220 UNTIL FALSE
  230
  240 DEF PROC_GRID
  250 FOR XS=0 TO 1278 STEP 1278/10
  260 PROC_LINE(XS,0,XS,1023,I%)
  270 NEXT
  280 FOR YS=0 TO 1023 STEP 1023/10
  290 PROC_LINE(0,YS,1279,YS,I%)
  300 NEXT
  310 ENDPROC
  320
  330 DEF PROC_DS1
  340 LOCAL A,B,C%
  350 FOR C%=100 TO 400 STEP 160
  360 B=C%*0.75:A=C%*0.6
  370 PROC_LINE(640,C%+512,B+640,512-A,I
%)
  380 PROC_LINE(B+640,512-A,640-B,512-A,
I%)
  390 PROC_LINE(640-B,512-A,640,C%+512,I
%)
  400 PROC_CIR(640,512,C%,I%)
  410 NEXT
  420 FOR C%=300 TO 400 STEP 30
  430 PROC_CIR(640,512,C%,I%)
  440 NEXT
  450 ENDPROC
  460
  470 DEF PROC_DS2
  480 PROC_JOHNNY(0,0,1.6)
  490 PROC_JOHNNY(400,0,1)
  500 PROC_JOHNNY(700,0,0.8)
  510 PROC_JOHNNY(1000,0,0.6)
  520 ENDPROC
  530
  540 DEF PROC_LINE(FX,FY,LX,LY,I%)
  550 LOCAL IX,IY,A,LI
  560 LI=200
  570 IF I%=0 THEN PROC_DRAW(FX,FY,0) EL
SE PROC_MAGIC(FX,FY,0)
  580 IX=(LX-FX)/LI:IY=(LY-FY)/LI
  590 FOR A=0 TO LI
  600 IF I%=0 THEN PROC_DRAW(FX,FY,1) EL
SE PROC_MAGIC(FX,FY,1)
  610 FX=FX+IX:FY=FY+IY
  620 NEXT
  630 ENDPROC
  640
  650 DEF PROC_CIR(X,Y,R,I%)
  660 LOCAL TH,X1,Y1,S
  670 S=360/80
  680 FOR TH=0 TO 360+S STEP S
  690 X1=X+(R*SIN(RAD(TH)))
  700 Y1=Y+(R*COS(RAD(TH)))
  710 IF I%=0 THEN PROC_DRAW(X1,Y1,TH) E
LSE PROC_MAGIC(X1,Y1,TH)
  720 NEXT
  730 ENDPROC
  740
  750 DEF PROC_MAGIC(X,Y,D)
  760 LOCAL X1,Y1,TH,R
  770 X=1280-X
  780 TH=RAD((X/1280*225)+67.5)
  790 R=(Y/1024)*YF1+YF2
  800 R=R*SC
  810 X1=640+R*SIN(TH)
  820 Y1=740+R*COS(TH)
  830 PROC_DRAW(X1,Y1,D)
  840 ENDPROC
  850
  860 DEF PROC_DRAW(X,Y,D)
  870 IFABS(X)>1E6 OR ABS(Y)>1E6 THEN EN
DPROC
  880 IF D=0 THEN MOVE X,Y ELSE DRAW X,Y
  890 ENDPROC
```

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like to print your results. I have written some Archimedes screen dump modules, using an error diffusion dithering technique, which look especially good with digitised images.

There are three versions depending on what printer you have – see the order form.

For those of you with a Master and lots of time it should be possible to modify Listing II to work with your computer, although I have not had time to try this. Basically you need to replace lines 50 and 350 with an appropriate LOAD command to fill your screen. Also the logic of lines 260 to 330 needs putting on the single line of the IF command and finally you need to remove references to TINT. However I can't vouch for how long it will take to run.

So now you can baffle friends, form secret signs and generally have a Magic Time.

```
   10 REM>Mirror.Magic2
   20 PRINT"Magic mirror off screen spri
te plotter"
   30 INPUT"Enter name of sprite file to
 use ",S$
   40 INPUT"Enter name of sprite file st
ore result",R$
   50 OSCLI("SCREENLOAD "+S$)
   60 M%=MODE
   70 *FX114,0
   80 MODE M%
   90 *FX112,1
  100 *FX113,1
  110 OSCLI("SCREENLOAD "+S$)
  120 TIME=0:REPEAT UNTIL TIME>100
  130 *FX113,0
  140 *FX112,0
  150 GCOL 128+63 TINT 255
  160 CLG
  170 CTH=RAD(22.5)+(2/PI)
  180 PI2=PI*2:PIH=PI/2
  190 XC=1279/RAD(225)
  200 YC=1023/380
  210 FOR XP%=26 TO 1260 STEP 2
  220 FOR YP%=116 TO 1023 STEP 4
  230 PROC_Cvert(XP%,YP%)
  240 X%=TH*XC
  250 Y%=(R-235)*YC
  260 IF X%>0 AND X%<1279 AND Y%>0 AND Y
%<1023 THEN
  270 *FX112,1
  280 C%=POINT(X%,Y%)
  290 T%=TINT(X%,Y%)
  300 *FX112,0
  310 GCOL C% TINT T%
  320 POINT XP%,YP%
  330 ENDIF
  340 NEXT:NEXT
  350 OSCLI("SCREENSAVE "+R$)
  360 VDU 7
  370 END
  380 :
  390 DEF PROC_Cvert(X%,Y%)
  400 dX%=640-X%
  410 dY%=768-Y%
  420 R=SQR(dX%^2+dY%^2)
  430 IF R<200 THEN ENDPROC
  440 IF dX%<>0 AND dY%<>0 THEN
  450 TH=ATN(dY%/dX%)
  460 ELSE
  470 IF dY%=0 AND dX%>0 THEN TH=PI ELSE
TH=0
  480 IF dX%=0 AND dY%>0 THEN TH=PIH
  490 IF dX%=0 AND dY%<0 THEN TH=PI+PIH
  500 ENDIF
  510 IF TH<0 THEN TH=PI+TH
  520 IF dY%>0 THEN TH=TH+PI
  530 TH=TH-RAD(157.5)
  540 IF TH<0 THEN TH=TH+PI2
  550 ENDPROC
```

Get it right

```
                              170 = B0C3 D   300 = C9F4 6   430 = 620E 5
                              180 = 9D14 D   310 = EFDE 6   440 =   5B 5
                              190 = 6AC9 D   320 = 6D30 F   450 = F097 2
                              200 = D983 9   330 =  8E1 C   460 = 18C0 A
                              210 = AA34 3   340 = 24BD A   470 = E6D0 A
10 =    0 0     90 = D9D5 F   220 = 37AF 8   350 = E860 D   480 = 8492 9
20 = ED00 0    100 = EEE5 2   230 = D6B6 6   360 = CC52 A   490 = 842E 1
30 = A029 5    110 = 2CCD 0   240 = 6AFD 7   370 = FD2E 5   500 =  8E1 B
40 = 5A2E 2    120 = 1D2F A   250 = 9C94 B   380 = 9719 0   510 = AC22 8
50 = 2CCD 3    130 = FEC4 D   260 = B595 B   390 = C92F 8   520 = B651 6
60 =  5A0 3    140 = C9F4 D   270 = D9D5 D   400 = 7F81 4   530 = AFB2 B
70 = 7B54 A    150 = 4655 B   280 = 5367 C   410 = 2373 E   540 = 243F C
80 = 1364 7    160 = 6A37 D   290 = A613 0   420 = 969E 7   550 = ED0F F
```

```
  900
  910 DEF PROC_JOHNNY(OX%,OY%,S)
  920 RESTORE 1030
  930 LOCAL X%,Y%,P%,C%
  940 READ P%,C%
  950 IF P%=0 THEN ENDPROC
  960 FOR A%=0 TO P%
  970 READ X%,Y%
  980 X%=X%*S+OX%:Y%=Y%*S+OY%
  990 IF I%=1 THEN PROC_MAGIC(X%,Y%,A%)
ELSE PROC_DRAW(X%,Y%,A%)
 1000 NEXT
 1010 GOTO 940
 1020
 1030 DATA 79,3,39,71,70,79,79,75,87,105
,108,196,131,240,146,279,190,195,199,169
,211,121,219,94,225,93,224,76
 1040 DATA268,63,270,73,248,83,237,94,24
5,95,229,205,215,285,198,349,204,413,228
,387,231,360,220,341,207,330
 1050 DATA212,312,234,328,255,354,257,38
9,253,400,258,403,237,443,219,468,201,48
5,215,507,194,507,182,506,174,514
 1060 DATA188,532,197,544,205,545,207,56
0,205,571,203,582,104,585,104,574,98,564
,99,551,107,550,110,537,120,527
 1070 DATA133,519,130,508,99,496,114,488
,100,469,83,441,63,393,66,389,59,355,52,
322,51,303,45,292,50,275
 1080 DATA58,282,67,284,67,298,67,316,87
,385,100,411,110,357,89,291,80,252,76,20
8,72,162,69,124,70,106
 1090 DATA71,100,43,72,1,3,132,569,132,5
69,1,3,171,568,171,568,2,3,152,574,152,5
47,169,548,2,3,170,534,154,527,138,533,2
,3,125,503
 1100 DATA158,459,102,495,2,3,199,488,15
6,459,178,499,4,3,105,388,113,408,113,43
5,191,432,200,402,4,3,175,409,170,383,13
3,383
 1110 DATA135,409,170,409,1,3,186,436,20
0,479,1,3,107,475,122,434,1,3,63,393,89,
381,1,3,219,96,240,97,1,1,87,102,69,106,
5,1,107,590
 1120 DATA79,587,81,597,233,596,234,585,
201,583,7,1,206,593,203,618,178,615,157,
615,138,618,122,619,109,620,108,600
 1130 DATA7,1,139,404,141,386,158,383,16
2,403,150,401,150,395,154,395,155,400
 1140 DATA 0,0
```

Get it right

```
                                370 = ACAE F   640 = D1AD 2    910 = ECFE 5
                                380 = BB52 8   650 = 56F1 8    920 = 98D3 1
                                390 = 504A 7   660 = 3474 6    930 = 8DC2 E
                                400 = C847 B   670 = ACE0 6    940 = 83D4 E
                                410 = 2C83 4   680 = FB45 8    950 = 37AD 1
                                420 = 67F4 6   690 = FE8B F    960 = BDCD 2
                                430 = C847 A   700 = 4183 F    970 = 6D41 B
                                440 = 2C83 2   710 = 5DC0 1    980 = 43A9 8
                                450 = ED0F 4   720 = 2C83 8    990 = 189A 7
 10 =    0 0    190 = 1384 4    460 = D1AD 8   730 = ED0F F   1000 = 2C83 4
 20 = 6075 5    200 = 9EDE B    470 = C8FC D   740 = D1AD 4   1010 = 161B 2
 30 = FA28 4    210 = CBB7 B    480 = 6076 E   750 = C416 9   1020 = D1AD 6
 40 = C1D0 1    220 = 226C 0    490 = 8B48 4   760 = 6D52 6   1030 = AA37 1
 50 = BFBA 4    230 = D1AD A    500 = 7532 E   770 = 83B0 4   1040 = A109 1
 60 = 7A16 A    240 = D44B E    510 = D4FB 6   780 = 153C B   1050 = 9DA5 E
 70 = CAA8 3    250 = CD1F D    520 = ED0F 4   790 = 9C12 D   1060 = F112 C
 80 = 109D B    260 = 327D 2    530 = D1AD 2   800 = 2C5F F   1070 = 1E70 B
 90 = B5EA 4    270 = 2C83 C    540 = 9DF2 E   810 = 5607 C   1080 =  EF9 A
100 = E2EF C    280 = F0F2 8    550 = 8160 3   820 = 3233 7   1090 = 2731 0
110 = A86F 1    290 = 180C 2    560 = 558B 2   830 = A759 A   1100 = 691E 0
120 = 37B9 7    300 = 2C83 F    570 =  3FB 8   840 = ED0F F   1110 = 61FB F
130 = 77F2 1    310 = ED0F F    580 = 831B 3   850 = D1AD 8   1120 = 7B9F E
140 = 7A16 7    320 = D1AD 1    590 = FF34 8   860 = 8F64 F   1130 = 4802 3
150 = 3084 1    330 = F89F 1    600 = E53C 9   870 = 1B8D 8   1140 = 3BFA B
160 = A96C 2    340 = 7F97 B    610 = 7DD5 F   880 = 24F2 D
170 = 76EE 9    350 = 570D E    620 = 2C83 7   890 = ED0F 7
180 = 4CA2 E    360 = 3236 1    630 = ED0F C   900 = D1AD 1
```

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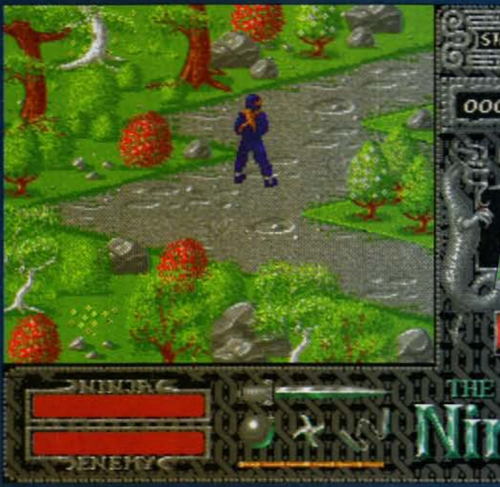
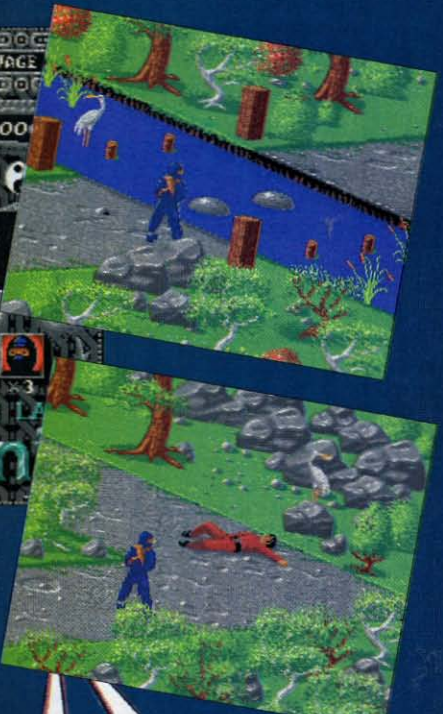
THE LAST NINJA

...shadow warrior





WELL here it is at last, the first of the Last Ninja saga. Is it worth the wait? – I think so. First the really good news: This isn't a straight conversion from the 16-bit formats so you get the whole screen for the graphics and 256 colours.

The title screen is really nice and the menu page fairly simple. You'll have to check out the full details about the controls in the manual – which is the inside of the inlay card in usual Superior style.

In case you've never come across The Last Ninja before here's a brief summary of the story so far... You are a ninja whose clan has been wiped out by the evil Shogun. He coveted some scrolls used in a special ninja ritual of your clan and stole them after killing almost all the brotherhood in a fiendish trap.

As the only survivor it's your duty to take revenge and recover the lost scrolls, so you enter the lair of the wicked Shogun and begin to deal with his minions.

The main display shows the separate screens in an isometric projection. You can walk across these, keeping to the path.

Movement is diagonal so the keys – which can be changed – are A, Z, " and ?. You can also jump using Alt. It's similar to Pandora's Box but if you've never come across this before you'll probably find it awkward at first, but it really is the best way of controlling things in this type of game.

I tried the mouse option but gave up almost immediately. I think you'll probably want to stick to the keys as well.

Moving around you'll find the two niggles I have: As you move along you can position your ninja so that he's off-centre as he walks off the screen. But regardless of his position on leaving he's always on the centre of the path as he enters the new screen. It's not very important but it grated because the rest was so good.

Rather more aggravating, though again not really important, is that the terrain you walk along is not logical and cannot be mapped without paths backtracking and crossing in places where they clearly don't. This seems to have been deliberate to confuse mappers but just ends up being annoying.

Another barrier to movement are pits and water that you have to jump across. The pits aren't really a problem but the water is a different matter. You have to position yourself exactly right to jump halfway across to the mud banks and logs that are available to land on. Positioning is critical and failure is death.

Occasionally you'll meet the servants of the Shogun – now done up in ninja garb themselves – and a fight follows, although in some instances you will be able to avoid them. You use the same keys for fighting as for moving except that you hold down Return.

Return+" and Return+? are attacking moves while Return+A and Return+Z are usually defensive – except when you're using shuriken or bombs in which case these keys mean throw. The Shift key is used to rotate through the available weapons while Control rotates through the objects you currently hold.

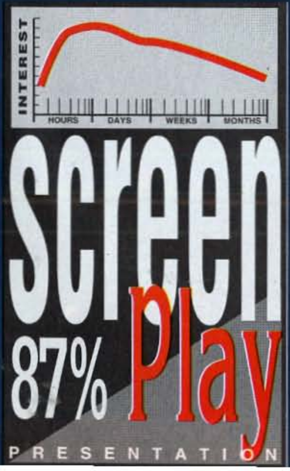
When you start you have no weapons but you can soon find a sword and the bombs while a bo stick and the shuriken are available on Level 2. There are many objects to pick up in addition to the weapons. There's a fly, potion bottles, gloves and so on. Not every object has a use – but you can't be sure until you've played the game out completely.

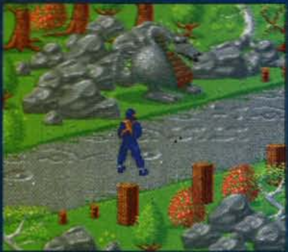
Watch out for the buddhas and shrines. If you pray in front of one it may tell you what items you should collect on the level. It's quite important to know otherwise you may find you can't get past the guardian at the end.

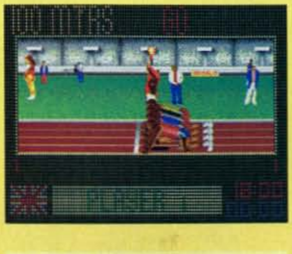
Yep there's a big nasty to contend with at the end of each level. The solution is never a matter of fighting but it always requires some astute thinking. There's always some relationship between the nasty and an object you are holding. But you do have to be careful because accidentally blundering into the nasty will lose you a life.

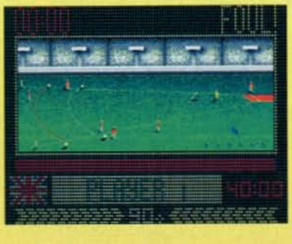
The Last Ninja is a great game – go silently and leave no witnesses.

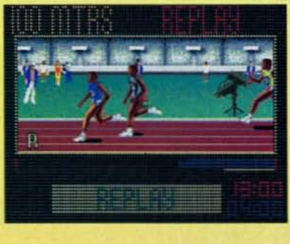
Steve Turnbull

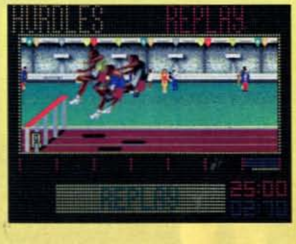












Price: £24.95
Supplier: Krisalis Software, Teque House, Masons Yard, Downs Row, Moorgate, Rotherham S60 2HD.
Tel: 0709 372290
Requirements: Risc OS

QUEST FOR GOLD

... viva España

EVERY four years the computer games market responds with a new Olympic bid of its own. The most likely contender on the Archimedes is Quest for Gold coded by Tony Love from Teque, published by Krisalis and promoted in a special Olympic Challenge by Acorn themselves.

Those of you with PC, ST or Amiga buddies can wave this game under their noses too as it is basically the same game due to be published by Psygnosis. The only difference is that where the Archimedes game features the top British track and field athletes, the other versions carry the name of Carl Lewis – a pity he didn't qualify for his main events.

There are two sections to the game and three ways of playing. You can opt for just the training side, take your squad from training into the stadium and waggle your mouse to victory or you could just play the arcade section.

The support of such top notch athletes such as Fatima Whitbread, Dalton Grant, Colin Jackson, Linford Christie, Steve Backley and John Regis is not just a gimmick as all through the training section you'll get hints from them on the best way to approach training – these are applicable to the game and to real-life competition.

You are the trainer and it is your job to manage the squad to success, so ignore this advice at your peril. Each athlete has four attributes: Agility, speed, power and stamina. Events require different combinations and various training techniques enhance different attributes. For instance hollow and repetitive running increase reaction time and speed.

Up to four trainers can play at once each choosing a different country on a very nice menu screen. The database holds details on 17 countries and 170 individual athletes.

The training option is educational because it follows real sporting practices. The dangers of over training are apparent and you are given statistical charts and profiles to let you see the progress of your olympic team.

If any one of your athletes doesn't rank at least 30 per cent in any attribute they'll fail the medical examination and won't be able to compete. This is a simulation.

You are given five weeks to train the members of your team to peak performance and make the final selection for each event. If you have opted for just the training side the computer will take over and the events will run solely on your earlier training techniques.

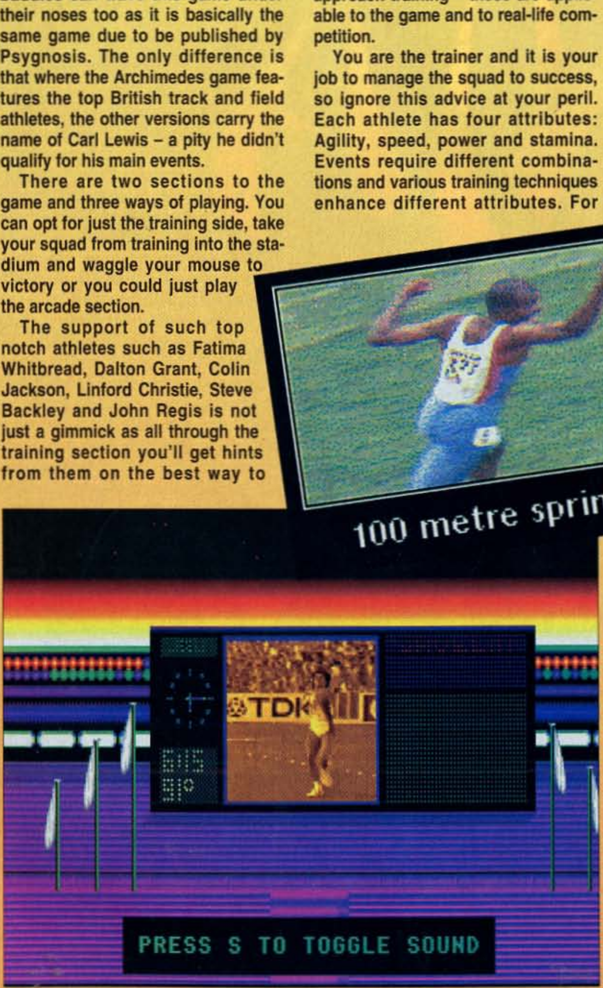
Arcade-only players are presented with a ready-trained squad all with average statistics. Your team won't reach world class standard but it's a good way to practice your mouse-wobbling technique.

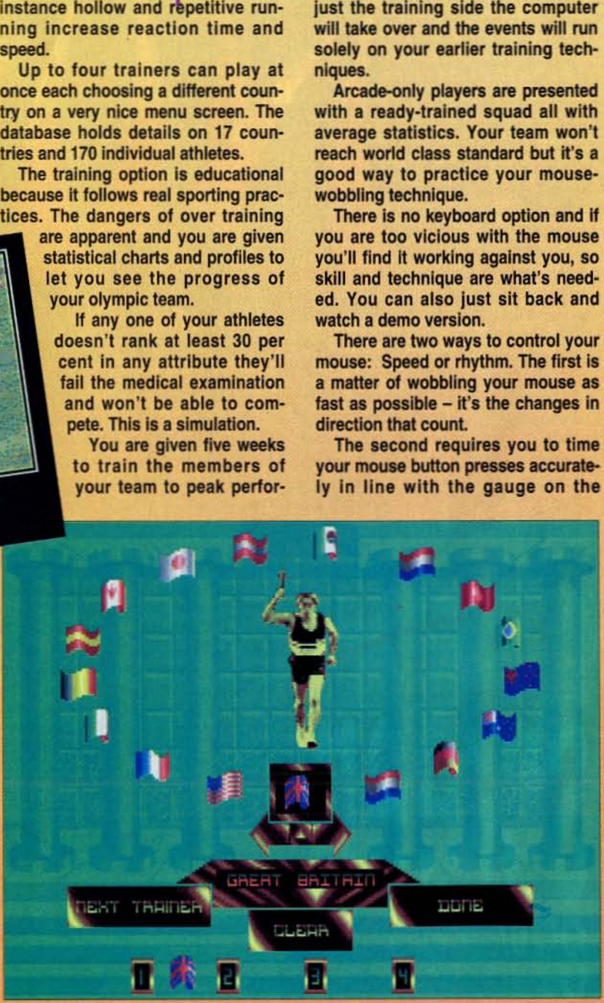
There is no keyboard option and if you are too vicious with the mouse you'll find it working against you, so skill and technique are what's needed. You can also just sit back and watch a demo version.

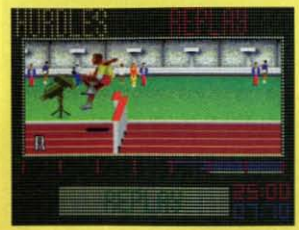
There are two ways to control your mouse: Speed or rhythm. The first is a matter of wobbling your mouse as fast as possible – it's the changes in direction that count.

The second requires you to time your mouse button presses accurately in line with the gauge on the

100 metre sprint







screen. I much prefer the wobble method even when you have to add mouse clicks to throw or jump at the right time.

The graphics are rather good. A standard camcorder was used to shoot the athletes in training, the frames were then digitised and the game sprites designed around them. The movement is superb and gives a very realistic feel to the arcade section.

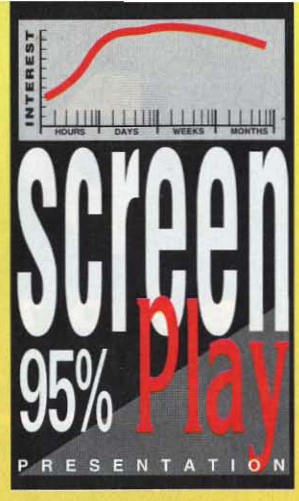
There are five events to compete in: 100m, javelin, 110m hurdles, high and long jumps. To get to the final and a chance of the medals you'll have to qualify.

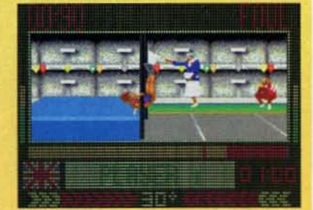
You'll have four athletes to run, jump or throw against. The qualifying time or distance and real-time scores are given on screen and you must qualify in all four heats to get to the final. An arrow shows which competitor is yours.

Initially you're working against either the clock, a height or a distance, rather than against the other athletes. It's just that the number you have to beat gets harder in each round.

There is an action replay after each running event too – this can be quite embarrassing. Take a look in the outfield and you'll see a lot of other things going on, though what that woman is doing with those bottles I'm not quite sure.

Once you get to the the finals – if you've got your training regime sorted out – there are some enhancements in the running especially if you are competing against your fellow team members. For example, if you had three squad members in the same final, there would be three versions of the same race. The first runner will compete with the other attributes of his fellow team mates showing.





The second and subsequent runners compete against the recording of the previous players. This is quite exciting and the digitised sound of the starter and gun create quite an atmosphere especially is there are a few of you playing.

As sports simulations go this one is very impressive. The management side is especially good and interesting and informative even for non-sports fans. All in all this game is a must for every couch potato who can now get the gain without the pain.

Pam Turnbull

QUEST FOR GOLD
KRISALIS
Acorn

Game Maker's Manual

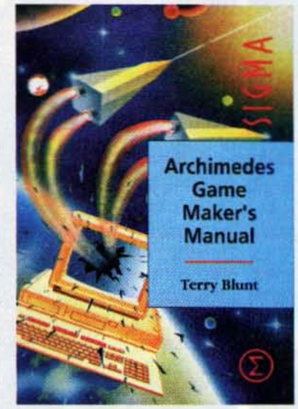
...the truth at last

Price: £12.95
Supplier: Sigma/Wiley, Baffins Lane, Chichester, West Sussex PO19 1UD.
Tel: 0243 775878

THE User Guide supplied with the original BBC micro was an excellent tutor/reference manual for all users, irrespective of programming competence.

The same cannot be said for the large tomes supplied with the 32-bit machines which, unlike the former, provide little in the way of helpful example listings.

Because of the complexity and architecture of Risc OS it was hardly surprising that some topics were only covered perfunctorily – such as sprites and graphics. New owners, like myself, were left wondering how to deploy the wonderful sprites, designed using !Paint, in their own Basic listings.



Now help is at hand in the form of Archimedes Game Maker's Manual by Terry Blunt.

This has to be the definitive guide to manipulating sprites using Risc OS via simple calls from Basic and it is packed, crammed, nay verily stuffed, with easy to understand and comprehensive listings, the majority in Basic thankfully.

That's just for starters: Remember this is a game maker's manual. Having discovered how simple it is to initialise sprites and plot them – how easy it would have been for Acorn to explain it, as opposed to providing oblique references spread across half a dozen manuals a foot thick.

It's all here, from scaling sprites to parallax scrolling, collision detection in many forms, wire frame drawing manipulation, in fact everything you always wanted to know about making games on the Archimedes but were afraid to admit you hadn't a clue.

The book starts off with some general dos and don'ts when it comes to writing games and how to plan one from inception, all the time providing a number of different solutions to every problem.

All types of games are explored from shoot-'em-ups and Breakout-type games through arcade/ adventure, strategy, platform, puzzle, role playing – it's got the lot.

The ingredients necessary for these type of games are discussed separately, and sensible suggestions are made when it comes to trading off speed against playability for example. All the commands to enable anyone to use bank switching, screen scrolling or anything useful are – for the first time anywhere – explained to the full.

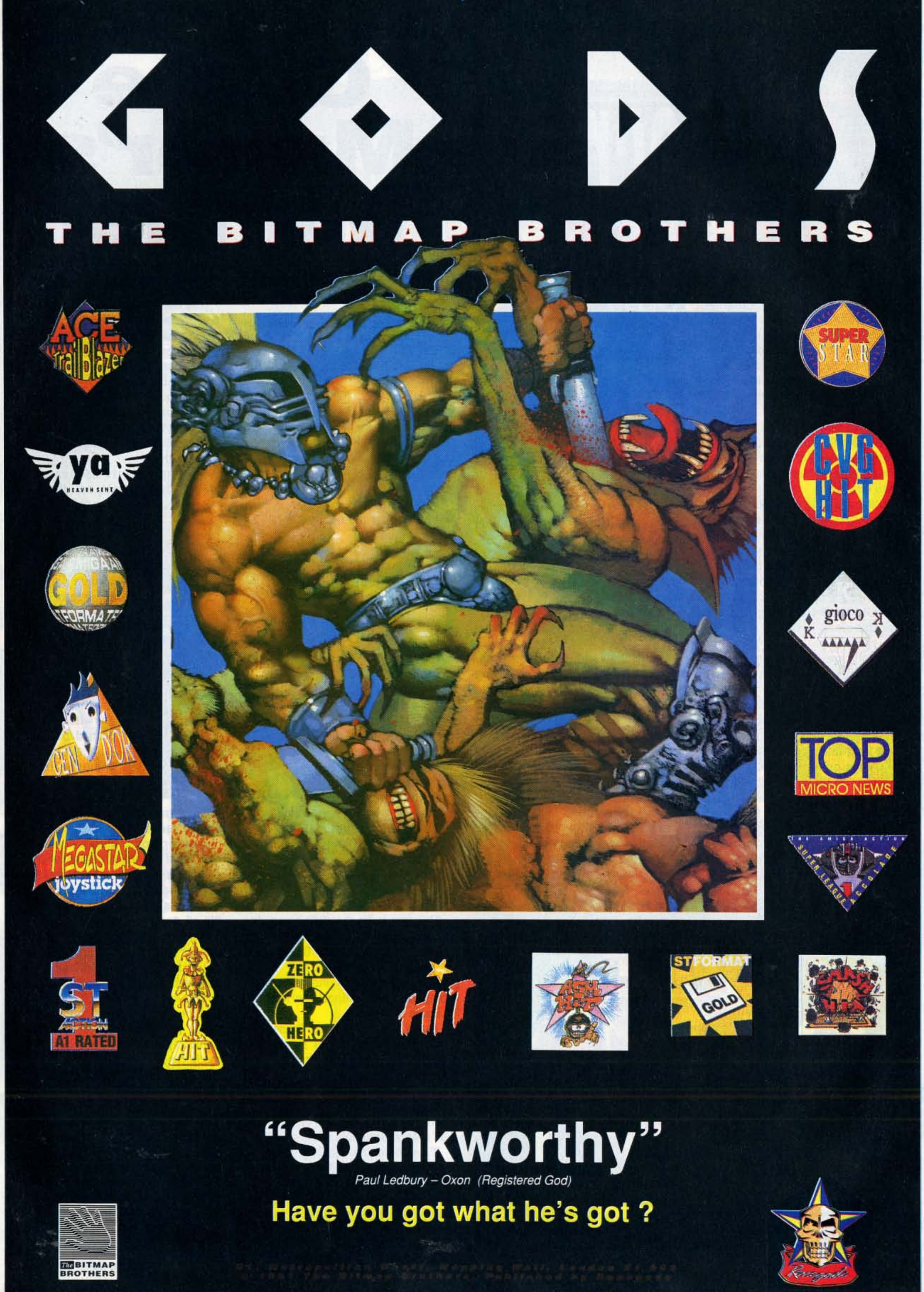
At every stage example listings are provided and, although not always minutely described, their quality renders any further description superfluous. There's none of the familiar "I haven't provided an example here as you should now have sufficient knowledge..." nonsense here.

There's no trial and error either, it's all done for you which is how it should be. The book continues like this for its entire 275 pages revealing astonishing hints and tips by the cartload.

The example listings are superb and form the main part of the manual while the last few pages contain handy sprite calls, plot codes and mode resolutions and the Index. The best 40 listings from the book are available on disc as an option.

If, like me, you thought the chapter on sprites had been lost from the Archimedes User Guide well fret no more. I've found it and I'm using it. So if you want to know how to use the Arc's graphics capabilities and sprites to full advantage and make better games, buy this book now. It's the only one you'll ever need.

Mike Goldberg and his cat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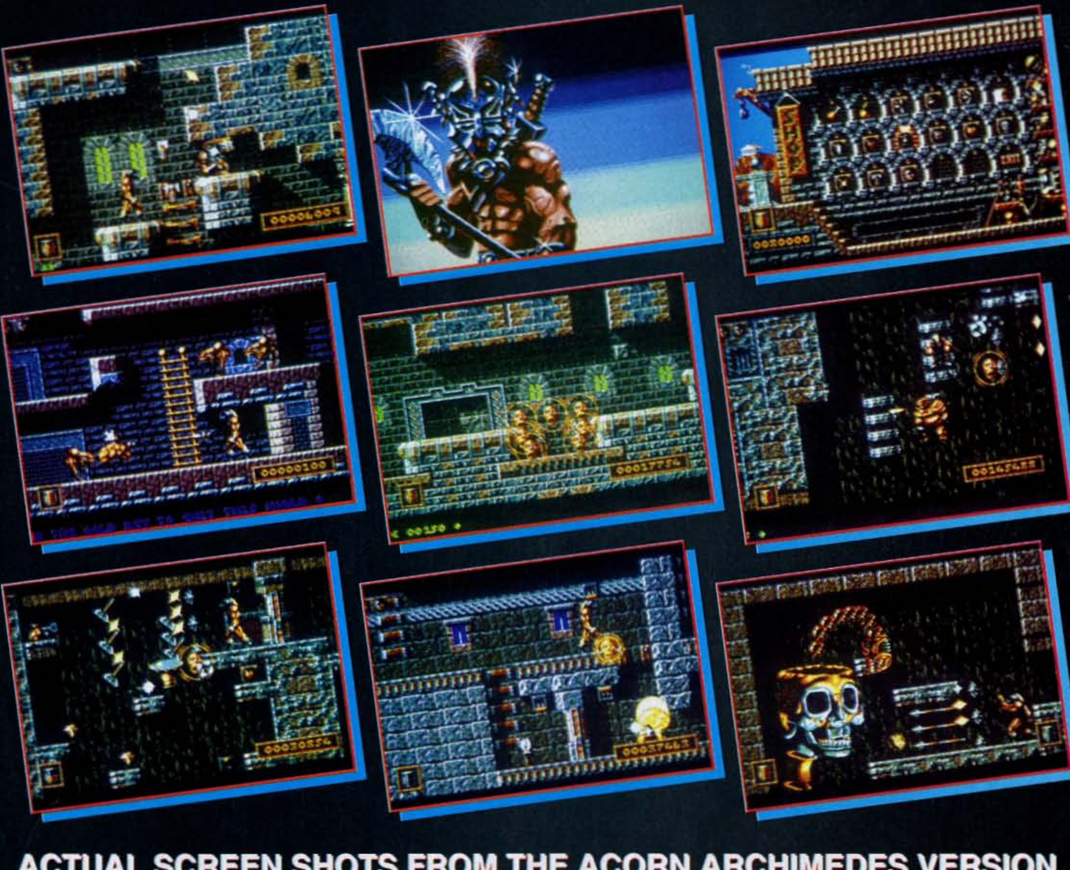

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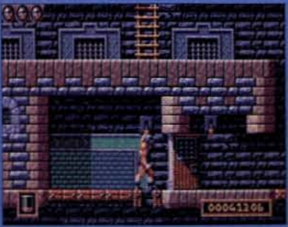

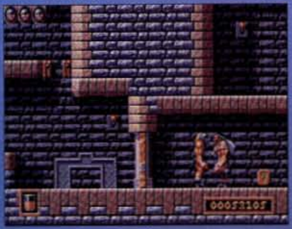

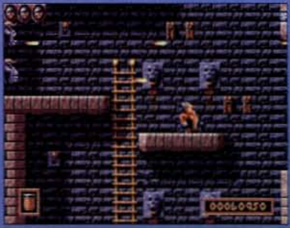

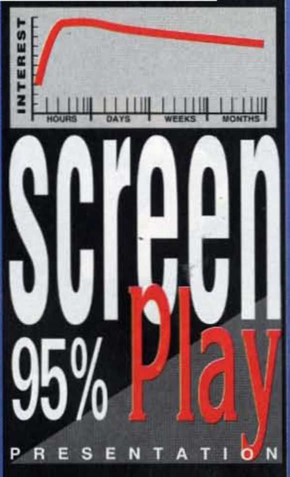

Price: £25.99
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Tel: 0709 372290
Requirements: Risc OS

Gods

...one of the chosen

I HAVEN'T enjoyed an adventure game as much as this since Pandora's Box. It's a ladders and levels challenge with puzzles, traps, great music, graphics, scrolling and just the right level of difficulty. Brilliant.

Richard Walker has made a very nice job of the conversion – I look forward to seeing what he has done with Populous. The introductory screens are very nicely put together and Nation XII's Into the Wonderful is a very nice piece of music with sampled voices thrown in.

The polish is what you expect from Krisalis and although the game is not original in concept it is good fun, time consuming and addictive.

Mythical gods were always a strange breed and those in this setting are no different. They have laid down a challenge – the one who succeeds will join their pantheon and gain immortality. That's you –our hero, bronzed, muscled and unflinching.

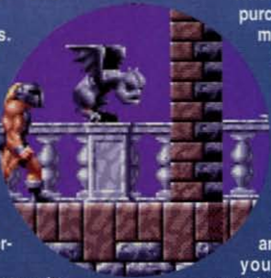
It would appear that a legendary city built as a plaything by the gods has been lost, stolen by forces of darkness and watched over by four great guardians and their minions. Rid the city of the invaders and the prize is yours.

You enter the city to explore, join battle with aliens, gargoyles, harpies and apemen – among many more – and do a spot of shopping.

The four levels are the city, temple, labyrinth and underworld, each split into three sections called worlds. You must exit each world by finding the key and the door that it fits.

Killing the beasts of chaos reveals a treasure, food, a key and so on. Shields are very useful, as is extra speed and improved weapons.

Keys open doors. Closed trapdoors and switches sometimes need keys, or they may just require you to discover the correct sequence to reveal a secret passage or help you escape certain death.



Much of the adventure is trial and error and you have three lives in which to complete it, although careful exploring will find things to give you more energy or even an extra life.

As you enter the third world you'll meet up with the shopkeeper, who pops up in a similar way to that visitor into the humdrum life of Mr Ben.

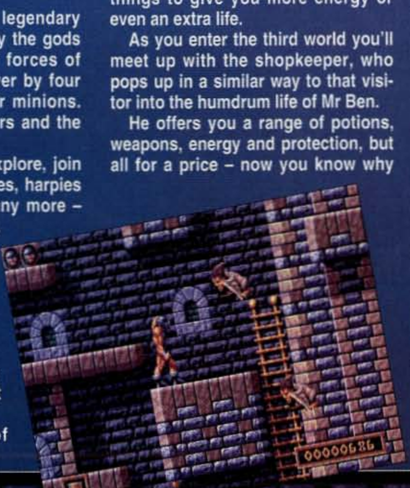
He offers you a range of potions, weapons, energy and protection, but all for a price – now you know why you should have collected all those crystals.

When you have made your purchases you are unceremoniously dumped back into the adventure. I was immediately mugged by some alien types and immediately impressed by my new fire power.

As you progress through the worlds and levels the monsters you encounter become more imaginative and that old D&D principle that statues always animate is borne out yet again.

If you're lucky you'll also meet the thief – a drone of a creature who can be used in quite a callous way to achieve your ends. But beware of the apes, they are a bunch of magpies who will steal keys and anything else not in your pockets. This can end your career as a god before you start if they pinch the world key at any time.

The puzzles are nicely put together and the difficulty level increases at just the right curve. Control is via joystick or keyboard and the response is good – although I do wish that you could fire and turn at the same time.



Positioning is all important in Gods and the teleport crystals are real life savers.

The clues are one of the nice details of this game. A question mark appears and as you run over it some scrolling text at the bottom of the screen gives you a hint or tells you what to do next.

A word to the wise though: Don't stop too long to read this as in my experience this is the cue for you to become submerged in all kinds of grobblies – after all that is what the F1 pause key is for.

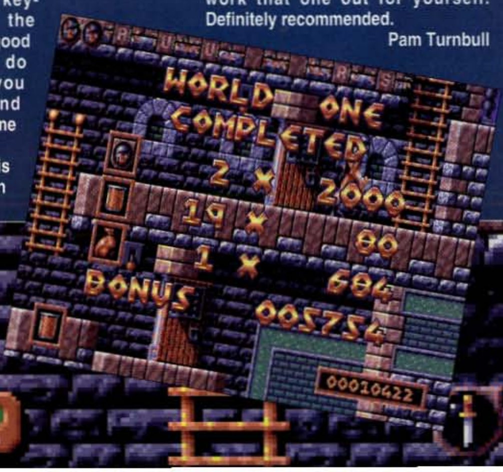
The sprites are large, their movement lifelike – when you drop things they bounce – and the detail and smooth movement is just what is needed in this kind of arcade adventure.

I would have liked a save option, but there is a password system built-in for each completed level.

One aspect which the original Bitmap Brothers spent some time on was zoning. It can be very frustrating to have negotiated a very tricky move through some hazards to then die and find yourself stuck five or six screens behind where you finished. In Gods you will go backwards but not as far in some similar games.

Classic adventures of this kind require a suitable monster at the end of each level. What does Gods give you? Why spoil the fun, you can work that one out for yourself. Definitely recommended.

Pam Turnbull



If music be the food of love ...

Teri Paul takes a bite out of the music side of the Acorn PD world

MUSIC has always been very popular on the Electron, BBC B, Master and Archimedes. The 32-bit range has been able to purloin some ideas from the Amiga side of the tracks and the results can be quite staggering.

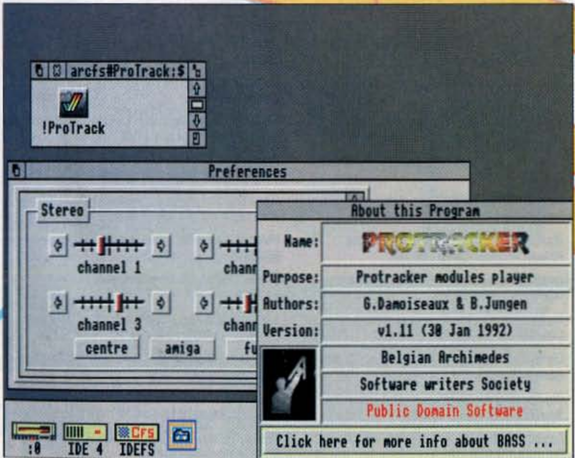
Pre-eminent among the very good players in the PD must be STracker, but this piece of code now has a new contender for top slot in the form of **ProTrack.**

Written by BASS members Gil Damoiseaux and Bernard Jungen this program lets you play music from the Amiga's ProTracker – a more recent version of the Amiga's SoundTracker – and from the Archimedes' Tracker, but in an enhanced form.

Control is similar to using a tape player with information about the current track such as the name of the instruments, length of the score, number of patterns and so on. You can also configure the program to your own preferences.

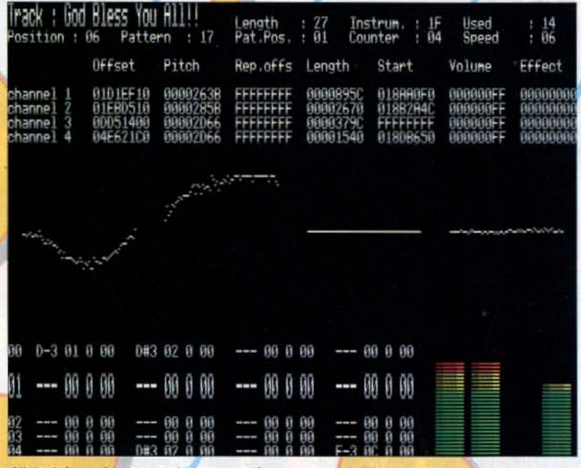
A ProTrack file uses effects which are all supported on the Amiga and gives a higher quality sound when the samples are played on the Archimedes. ProTrack is easy to use: Just double-click on the icon, double-click on a music file or drag it to the ProTrack icon on the iconbar.

There are four channels of stereo positions with eight arrows at the sides or you can use one of the three preset positions: Centre – all channels are centred, Amiga – the same setup as the Amiga, or Full – channels 1 to 4 are full.



Name: PROTRACKER
Purpose: Protracker modules player
Authors: G.Damoiseaux & B.Jungen
Version: v1.11 (30 Jan 1992)
Belgian Archimedes
Software writers Society
Public Domain Software

Choose the type of sounds you want



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Track : God Bless You All!!      Length   : 27  Instrum. : 1F  Used   : 14
Position : 06   Pattern  : 17    Pat.Pos. : 01  Counter  : 04  Speed  : 06

           Offset    Pitch     Rep.offs  Length    Start     Volume    Effect

channel 1  01D1EF10  0000263B  FFFFFFFF  0000895C  018AA0F0  000000FF  0000000
channel 2  01EBD510  0000285B  FFFFFFFF  00002670  018B2A4C  000000FF  0000000
channel 3  0DD51400  00002D66  FFFFFFFF  0000379C  FFFFFFFF  000000FF  0000000
channel 4  04E621C0  00002D66  FFFFFFFF  00001540  018DB650  000000FF  0000000

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04  --- 00 0 00   D#3 02 0 00   --- 00 0 00   F-3 0C 0 00
```

All the information you could ever need?

Tracker and ProTracker implement some sound effect commands differently, so BASS advise that you keep all your tunes in their original format. The ProTracker format for four voices also uses less disc space.

ProTrack will try to reconstitute the maximum tune data without alteration but some data may be lost or may have been modified by the conversion and/or by the user using Tracker.

Sibelius to samples

David Radford has been working on a selection of programs to enhance the use of samples. His **Compress** v1.15 allows you to compress and decompress Armadeus sample files. The compressor is actually one of a suite of programs available in the PD – the others are **Player, CompUtils** and **SoundCtrl.**

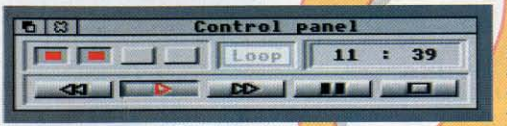
Player lets you play back the compressed samples without decompression in single or sequence format. Anyone who has dabbled with sampling will realise just how space consuming the results can be – on average a one second sample takes 20k of memory!

Compression and decompression are mainly accomplished in the background although removing the status window will speed things up somewhat. This window gives you information of the current files as well as options to flag which affect the compression.

SoundCtrl is a more general package which gives you access to what is going on with many music or sampling packages. You can control and alter most of the parameters as well as monitor the sound system.

This leaves CompUtils which is really a programming tool giving additional support for anyone who wants to add compressed samples to their work. In particular a piece of code called Expand uncompresses samples produced by Compress. Do remember the courtesy of contacting

➤



Keeping control of your sounds

David before you use any of these programs in a commercial product.

BBC selective

A new utility also from David Radford, **BBCSelect**, allows you to double-click on a BBC Font file without the messy command window appearing. It's for people with an Archimedes and a large number of BBC fonts, who can't remember what they look like.

Joint BBC and Archimedes house, Mad Rabbit Systems, are now being managed from Merseyside and they are the only official stockists of The Yorkshire Boys' products.

Next from this tribe is **Retribution**, a demo which has taken about 14 months to code. Available as shareware – the registration fee is £5 – it contains a game. As this is the second such demo in as many months to follow this format, I wonder if this is to be the trend?

Good and bad news

Following on from last month's story that Duncan Webster was folding 8-bit Software, comes the news that DG Shimmin has taken over the library. You can get a free copy of issue 20 of the catalogue if you write to: 8-bit Software, 1 Oakwood Drive, Heaton, Bolton BL1 5EE with a formatted DFS DS 80 track disc and return postage and packing.

But just as I heard the good news about 8BS, Morry of the Moribund Hedgehog let me know that he has now closed MHPD as the demand was too much! Oh well.

To finish on good news there is Dan Wilson, the man behind BrokenARM Music. He actually writes music for the Archimedes – rather than downloading Amiga files – but he has kept quite a low profile as his work was never released into the PD. This is about to change.

Dan is about to admit some of his music into the PD and he is also working on the feasibility of setting up a PD library dealing with quality native Archimedes tracker music.

Despairing of the missed music capabilities of the Archimedes over the Amiga is he is also working on some hardware projects to rectify this with Vertical Twist and on his own. These won't be PD but should enhance the music power of the 32-bit over the 16-bit machines.

Mastering DTP

Leaving both music and Archimedes behind, John Farmer is distributing a desktop publishing package which he wrote using Andy Nibb's Aristotle windows rom for BBC machines.

PD Publisher is a rather nifty piece of programming but it is unfortunate that it is only available for BBC Master owners. It also requires four banks of sideways ram to be both empty and enabled.

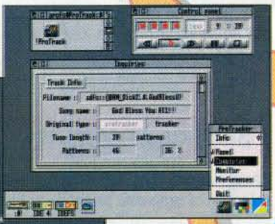
Once it's loaded you are presented with a choice of background and text colour. The main program is controlled through five icons for text, tools, converting clip art, changing the colours and saving your work.

The pointer is moved with the cursor keys and Ctrl is used to simulate the mouse click to select an option – it is also accompanied by a pling noise.

Starting with text you can decide the height and width of your purple prose, but the documentation warns that if you choose too high a number the entire program will crash. Not the most friendly of results but at least you've been told.

You type in the normal way with Return fixing the text in place. Your next bit of text must be positioned with the cursor before you start typing. This can be a little fiddly, but it's easy enough to master. If you don't fix the text before you return to the menu screen, you'll lose it.

What makes DTP special is the ability to illustrate or incorporate drawings with text. PD Publisher v2.15 lets you use clip art found in the PD or from such commercial DTP packages as Wapping Editor and AMX Publisher. This can be positioned and repositioned as you want. However, if you prefer you can make use of the basic drawing facility instead.



Protrack has a good user interface

adfs::BlankDisc.$.Samples
!Sequence
AllStop
Argument
AyeSir
CantAccept
Chaos
CL42761/9
CourseLaid
Engage
Hailing
IAmAVulcan
InError
Microbrain
NoHarm
NoLife
NotAll0
OhGod!
Picard
Properly
ShieldsUp
SoundCtrl
Info
DMA rate
Channels
Reset
Speaker
Audio
Quit
Chans
1
2
4
8

A must for StarTrek fans

Sourcing

Products mentioned in this article are credited to the PD library we obtained them from. Other libraries will often have the same programs on their files.

PD LIBRARIES

8-bit houses

BBC PD,18 Carlton Close, Blackrod, Bolton BL6 5DL.

Different Ideas PD, Eyton House, Eyton, Leominster, Herts HR6 0AG.

Elk PD, 5 Edward Street, Clifton, Brighouse HG6 1QR.

Frisky Clams, 37 Cassiobury Drive, Watford, Herts WD1 3AA.

GLM PD, 2 Pierrefondes Avenue, Farnborough, Hampshire GU14 8NF.

HeadFirst PD, 97 Chester Road, Southport PR9 7HH.

JD Public Domain, 7 Klembergerweg, 7214 BK Epse, Holland.

JJF PD, 49 Hollberry Close, Wingates Green, Redditch, Worcester B98 0QT.

Robert Pike, 4 Mayfield Road, Girton Cambridge CB3 0PH.

Mad Rabbit PD, 174 Duke Street, Southport, Merseyside PR8 5EL.

MasterDisc, 2 Seaview, Hoylake L47 2DD.

Re-Run, 1 Northholme Close, Grays, Essex RM16 2NX.

ScreenTeach, 21 Highlands Road, Rochdale, Lancashire.

The Wizard - BBC, Ryburn, Thorpe Lane, Cawood, Selby, North Yorkshire YO8 0SQ.

32-bit houses

Abyss Software, 35 Grantley Crescent, Kingswinford, Valley Fields, West Mids DY6 9EH.

Arcaynia, PO BOX 1927, Sutton Coldfield B74 3YZ.

ArchAngel, 9 Chancel Court, Chancel Lane, Pinhoe, Exeter EX4 8QE.

Arch PD, 109 Ferry Road, Hullbridge, Hockley, Essex SS5 6EL.

Busy Bee Computers, PO Box 25, Ormskirk, Lancashire L39 3QR.

RE Clark PD Library, Westbourne House, 34 Bradley Street, Wooton-under-Edge GL12 7AR.

Cream PD, 38 Baunton, Cirencester, Gloscester GL7 7BB.

Datafile PD, 22 Duxford Drive, Aldergrove, County Antrim, Northern Ireland BT29 4BG.

Diamond PD, 86 Meadowbank, Moor Lane, Holway, Holywell, Clwyd CH8 7EF.

DataStream, 32 Hollinwell Avenue, Wollaton, Nottingham NG8 1JZ.

Digital Illusions, 20 College Road, Wembley, Middlesex HA9 8RL.

Digital Phenomena, 104 Manners Road, Southsea, Hants PO4 0BG.

DigiTech PD, 20 Downing Crescent, Bottesfird, Scunthorpe, South Humberside DN16 3LS.

Equinox PD, 27 Station Road, Earls Barton, Northampton NN6 0NT.

Genesis PD, 19 The Greenway, Hillfields, Bristol BS16 4HB.

Low Cost PD, 6 Furzeland House, Sheephouse Way, New Malden, Surrey KT3 5PH.

Mad Rabbit PD, 174 Duke Street, Southport, Merseyside PR8 5EL.

Naked PD, Fayence, Fulford Road, Fulford, Stoke-on-Trent ST11 9QT.

Ozone-Friendly PD, 180 Cumnor Hill, Oxford OX2 9PJ.

Power to the Programmers, 1st Floor, 23 Cooper Street, Nelson, Lancashire BB9 7XW.

Prime PD, 29 Tulworth Road, Poynton, Stockport, Cheshire SK12 1BQ.

Risc PD, Potteries House, Rannoch School, By Pitlochry, Perthshire PH17 2QQ.

RML PD, 24 Penryn Close, Norwich NR4 7LY.

Skyfall, PO Box 2220, Birmingham B43 5R2.

Soft Rock Software, 124 Marissal Road, Henbury, Bristol BS10 7NP.

Spidersoft PD, 218 Saville Park Road, Halifax, West Yorkshire HX1 2XS.

Telstar PD, The Jam Factory, 20 Alderbrook Close, Rolleston, Staffs DE13 9AH.

Matthew White, The Pines, 7 Peasehome, Hessle, North Humberside HU13 0HY.

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LET'S COMPUTE!

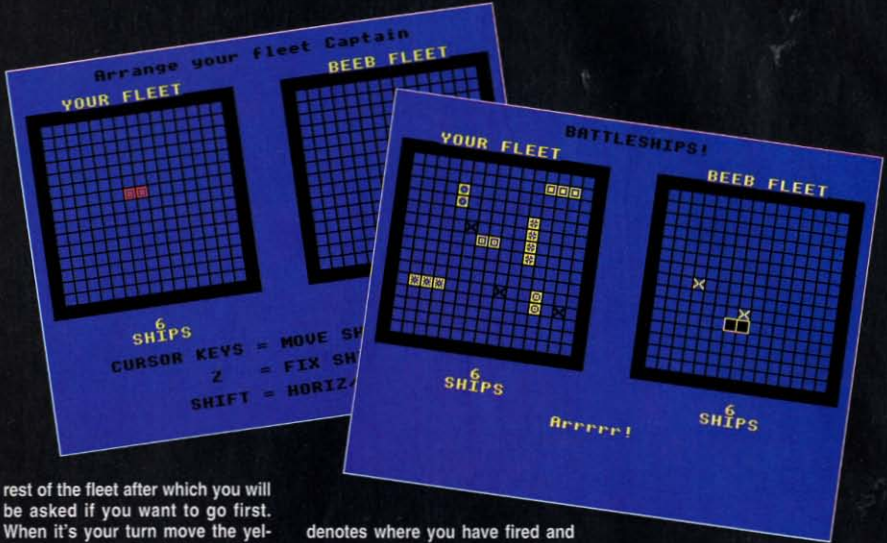
Rom and Ram

SHIVER me timbers, splice the mainbrace and keel-haul those pesky ducks! Yes, summer's here and Rom has gone all nautical. Trouble is he's making waves and Ram is sick of Rom splashing it all over. So Ram has devised a computer version of the maritime mayhem that Rom is causing: Battleships.

The action takes place between two opposing navies – yours and the computer's – represented by blocks placed on two grids. The port (left) grid is where you arrange your own fleet and the starboard (right) grid is where the enemy hides its fleet. Whoever sinks the other's fleet first is the victor.

Firstly you are invited to arrange your fleet which consists of three cruisers (1x2 blocks), two destroyers (1x3 blocks) and a battleship (1x4 blocks). Use the cursor quays – sorry, keys – to move each ship and Shift to alter the ship between horizontal and vertical. When you are happy with the position of a ship press Z to anchor it in place.

Now repeat the process for the rest of the fleet after which you will be asked if you want to go first. When it's your turn move the yellow box on the Beeb fleet grid to where you think the computer has hidden one of its ships and fire – with Z or Return.



```
Arrange your fleet Captain
YOUR FLEET            BEEB FLEET

6
SHIPS
CURSOR KEYS = MOVE SH
Z           = FIX SH
SHIFT       = HORIZ
```

```
                  BATTLESHIPS!
YOUR FLEET                    BEEB FLEET

6                                    6
SHIPS            Arrrrr!          SHIPS
```

If you miss, a yellow cross denotes where you have fired and you cannot fire there again. If you hit something you'll hear a ripping noise and the square will turn black with a yellow border.

NEEEAAYOWW!
DAKKER-DAKKER
HMS
ABANDON SHIP!

What you've hit remains a mystery until every part of it has been struck – only then will it be sunk. Each sinking is accompanied by a heartwarming arrrr! and sounds of destruction.

When all six ships are sunk that fleet has lost and you can start again.

Unlike Rom the program is reasonably intelligent when it comes to destroying your ships. Like you it first fires at random until a hit occurs. From then on fire will be concentrated around the first hit until a further hit occurs.

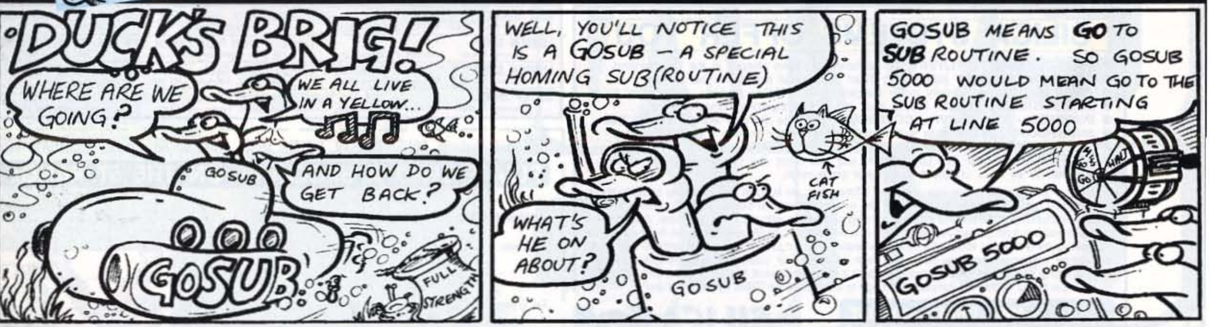
The computer will continue to fire in a certain direction until either it misses, in which case a different direction is tried, or the ship is sunk.

Or put simply, if the computer scores a hit it's Abandon ship! Women and children first! mode. After that it's back to a random search of your fleet and a repeat of the above process.

A substantial part of the program has been written using GOSUBs as well as procedures – see the Duck's Brig. This is to demonstrate the usefulness of Gosubs when you may feel using a procedure tantamount to overkill.

The only drawback with Gosub, and its naughty cousin GoTo, is that there is no parameter passing. Keeping track of where you are in a program can get to be a problem – although a hearty helping of REM statements should help titanically.

● *Well, time and tide wait for no man so our two buoys, Rom and Ram, must weigh anchor, take their bows and set sail for the sunset. Fifteen men on a dead man's chest, yo ho ho and a Battle with Rom.*

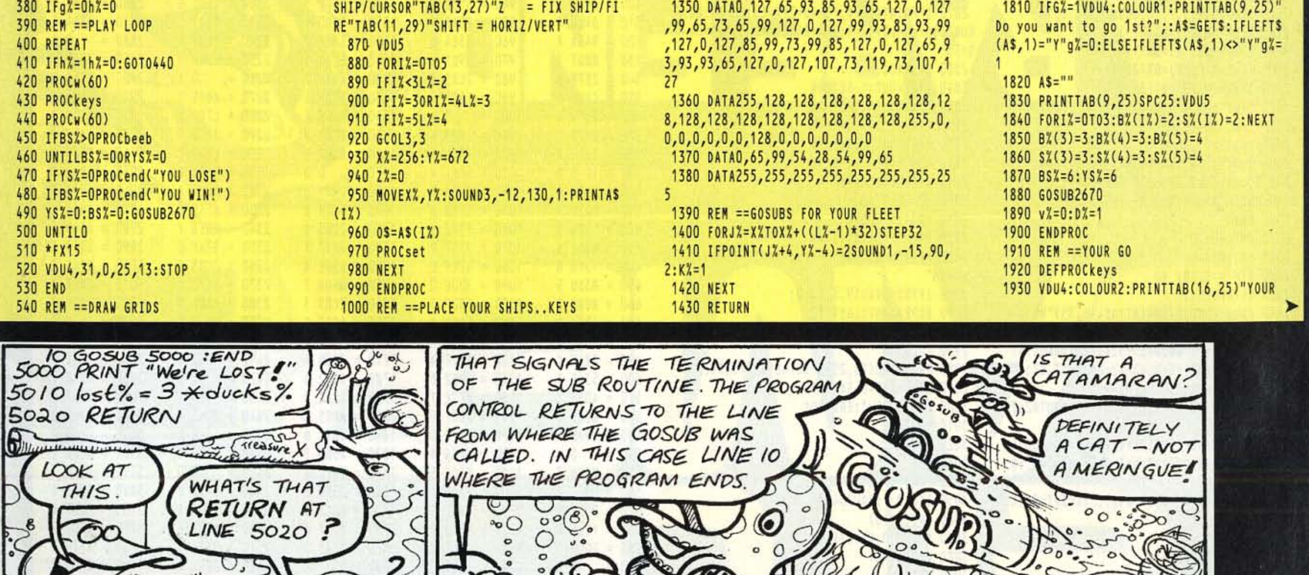

DUCK'S BRIG!
WHERE ARE WE GOING?
WE ALL LIVE IN A YELLOW...
AND HOW DO WE GET BACK?
GOSUB
GOSUB
FULL STRENGTH
WELL, YOU'LL NOTICE THIS IS A GOSUB – A SPECIAL HOMING SUB(ROUTINE)
WHAT'S HE ON ABOUT?
CAT FISH
GOSUB
GOSUB MEANS GO TO SUB ROUTINE. SO GOSUB 5000 WOULD MEAN GO TO THE SUB ROUTINE STARTING AT LINE 5000
GOSUB 5000

Under fire

Mike Goldberg lets loose with his salty sea dogs

```
   10 REM Battleships
   20 REM by Mike Goldberg
   30 REM (c) The Micro User
   40 IFPAGE<&8000IFPAGE>&E00GOTO3130
   50 CLEAR
   60 ENVELOPE1,1,-2,2,3,1,1,8,50,-1,-1,
-1,120,100
   70 ENVELOPE2,1,4,0,0,60,120,0,2,-1,-1
,-1,0,0
   80 ENVELOPE3,2,-2,0,0,255,0,0,126,-1,
-1,-1,120,90
   90 ENVELOPE4,3,4,70,-50,1,1,10,126,-1
,-1,-6,100,10
  100 REM
  110 REM
  120 *FX4,2
  130 ONERRORGOTO3020
  140 MODE1
  150 DIMA$(5),B$(5),B%(5),S%(5)
  160 FORI%=224TO235
  170 READA,B,C,D,E,F,G,H
  180 VDU23,I%,A,B,C,D,E,F,G,H
  190 NEXT
  200 VDU23;8202;0;0;0;
  210 PROCinit
  220 REPEAT
  230 VDU19,0,4;0;19,1,0;0;19,2,3;0;19,3
,1;0;
  240 GCOL0,129
  250 VDU24,32;352;576;896;:CLG
  260 VDU24,704;352;1248;896;:CLG
  270 GCOL0,128
  280 VDU24,64;384;544;864;:CLG
  290 VDU24,736;384;1216;864;:CLG
  300 VDU26
  310 PROCgrid(64,384)
  320 PROCgrid(736,384)
  330 BS%=6:YS%=6:GOSUB2670
  340 PROCset_fleet
  350 PROCBBC_fleet
  360 PROCstart
  370 IFg%=1h%=1
  380 IFg%=0h%=0
  390 REM ==PLAY LOOP
  400 REPEAT
  410 IFh%=1h%=0:GOTO440
  420 PROCw(60)
  430 PROCkeys
  440 PROCw(60)
  450 IFBS%>0PROCbeeb
  460 UNTILBS%=0ORYS%=0
  470 IFYS%=0PROCend("YOU LOSE")
  480 IFBS%=0PROCend("YOU WIN!")
  490 YS%=0:BS%=0:GOSUB2670
  500 UNTIL0
  510 *FX15
  520 VDU4,31,0,25,13:STOP
  530 END
  540 REM ==DRAW GRIDS
  550 DEFPROCgrid(X%,Y%)
  560 GCOL0,1
  570 y%=Y%:FORI%=X%TOX%+480STEP32:MOVEI
%,Y%:PLOT1,0,480:MOVEX%,y%:PLOT1,480,0:y
%=y%+32:NEXT
  580 IFG%=1COLOUR2:PRINTTAB(4,3)"YOUR F
LEET"TAB(26,3)"BEEB FLEET"TAB(7,23)"SHIP
S"TAB(28,23)"SHIPS"
  590 ENDPROC
  600 REM ==INIT
  610 DEFPROCinit
  620 G%=1
  630 W1%=20
  640 W2%=30
  650 M%=32
  660 X$=CHR$224
  670 L$=CHR$8+CHR$10
  680 A$(0)=STRING$(2,CHR$224)
  690 B$(0)=CHR$224+L$+CHR$224
  700 A$(1)=STRING$(2,CHR$225)
  710 B$(1)=CHR$225+L$+CHR$225
  720 A$(2)=STRING$(2,CHR$226)
  730 B$(2)=CHR$226+L$+CHR$226
  740 A$(3)=STRING$(3,CHR$227)
  750 B$(3)=CHR$227+L$+CHR$227+L$+CHR$22
7
  760 A$(4)=STRING$(3,CHR$228)
  770 B$(4)=CHR$228+L$+CHR$228+L$+CHR$22
8
  780 A$(5)=STRING$(4,CHR$229)
  790 B$(5)=CHR$229+L$+CHR$229+L$+CHR$22
9+L$+CHR$229
  800 X$=CHR$230+CHR$231+L$+CHR$8+CHR$23
2+CHR$233
  810 ENDPROC
  820 REM ==SET UP YOUR FLEET
  830 DEFPROCset_fleet
  840 VDU4:COLOUR1:a$="Arrange your flee
t Captain"
  850 FORI=1TOLENa$:PRINTTAB(6+I,1)MID$(
a$,I,1):PROCw(4):SOUND1,-8,40,1:NEXT
  860 PRINTTAB(5,25)"CURSOR KEYS = MOVE 
SHIP/CURSOR"TAB(13,27)"Z   = FIX SHIP/FI
RE"TAB(11,29)"SHIFT = HORIZ/VERT"
  870 VDU5
  880 FORI%=0TO5
  890 IFI%<3L%=2
  900 IFI%=3ORI%=4L%=3
  910 IFI%=5L%=4
  920 GCOL3,3
  930 X%=256:Y%=672
  940 Z%=0
  950 MOVEX%,Y%:SOUND3,-12,130,1:PRINTA$
(I%)
  960 O$=A$(I%)
  970 PROCset
  980 NEXT
  990 ENDPROC
 1000 REM ==PLACE YOUR SHIPS..KEYS
 1010 DEFPROCset
 1020 REPEAT TT%=TIME+5:REPEAT UNTIL TIM
E>TT%
 1030 IFINKEY(-26)PROCm(-M%,0)
 1040 IFINKEY(-122)PROCm(M%,0)
 1050 IFINKEY(-58)PROCm(0,M%)
 1060 IFINKEY(-42)PROCm(0,-M%)
 1070 IFINKEY(-1)ANDO$=A$(I%)ANDY%-(L%*3
2)>352MOVEX%,Y%:PRINTO$:O$=B$(I%):Z%=1:S
OUND2,-12,100,1:MOVEX%,Y%:PRINTO$:PROCw(
W1%)
 1080 IFINKEY(-1)ANDO$=B$(I%)ANDX%+(L%*3
2)<576MOVEX%,Y%:PRINTO$:O$=A$(I%):Z%=0:S
OUND2,-12,100,1:MOVEX%,Y%:PRINTO$:PROCw(
W1%)
 1090 UNTILINKEY(-74)ORINKEY(-98)
 1100 K%=0
 1110 SOUND3,-14,10,1
 1120 IFZ%=0:MOVEX%,Y%:PRINTO$:GOSUB1400
 1130 IFZ%=1:MOVEX%,Y%:PRINTO$:GOSUB1440
 1140 IFK%=1MOVEX%,Y%:PRINTO$:GOTO1020
 1150 GCOL0,2:MOVEX%,Y%:PRINTO$:PROCw(W2
%)
 1160 ENDPROC
 1170 REM ==MOVE (placing your ships)
 1180 DEFPROCm(x%,y%)
 1190 IFX%+x%<64ORY%+y%>864ENDPROC
 1200 IFZ%=0:IFX%+x%+(L%*32)=576ENDPROC
 1210 IFZ%=0:IFY%+y%=384ENDPROC
 1220 IFZ%=1:IFX%+x%=544ENDPROC
 1230 IFZ%=1:IFY%+y%-(L%*32)=352ENDPROC
 1240 GCOL3,3
 1250 MOVEX%,Y%
 1260 PRINTO$
 1270 X%=X%+x%:Y%=Y%+y%
 1280 MOVEX%,Y%
 1290 PRINTO$
 1300 ENDPROC
 1310 REM ==DELAY
 1320 DEFPROCw(w%)
 1330 TIME=0:REPEATUNTILTIME>w%
 1340 ENDPROC
 1350 DATA0,127,65,93,85,93,65,127,0,127
,99,65,73,65,99,127,0,127,99,93,85,93,99
,127,0,127,85,99,73,99,85,127,0,127,65,9
3,93,93,65,127,0,127,107,73,119,73,107,1
27
 1360 DATA255,128,128,128,128,128,128,12
8,128,128,128,128,128,128,128,128,255,0,
0,0,0,0,0,128,0,0,0,0,0,0,0
 1370 DATA0,65,99,54,28,54,99,65
 1380 DATA255,255,255,255,255,255,255,25
5
 1390 REM ==GOSUBS FOR YOUR FLEET
 1400 FORJ%=X%TOX%+((L%-1)*32)STEP32
 1410 IFPOINT(J%+4,Y%-4)=2SOUND1,-15,90,
2:K%=1
 1420 NEXT
 1430 RETURN
 1440 FORJ%=Y%TOY%-((L%-1)*32)STEP-32
 1450 IFPOINT(X%+4,J%-4)=2SOUND1,-15,90,
2:K%=1
 1460 NEXT
 1470 RETURN
 1480 REM ==BEEB's Fleet
 1490 DEFPROCBBC_fleet
 1500 VDU19,3,4;0;
 1510 GCOL0,3
 1520 FORT%=0TO5
 1530 IFT%<3L%=1
 1540 IFT%=3ORT%=4L%=2
 1550 IFT%=5L%=3
 1560 R%=RND(2)
 1570 IFR%=1O$=A$(T%)ELSEO$=B$(T%)
 1580 IFR%=1I%=RND(15-L%)*32+704:J%=RND(
15)*32+384
 1590 IFR%=2J%=896-RND(15-L%)*32:I%=RND(
15)*32+704
 1600 K%=0
 1610 IFR%=1GOSUB1680
 1620 IFR%=2GOSUB1720
 1630 IFK%=1GOTO1560
 1640 MOVEI%,J%:PRINTO$
 1650 NEXT
 1660 ENDPROC
 1670 REM ==GOSUBS FOR BEEB FLEET
 1680 FORU%=I%TOI%+(L%*32)STEP32
 1690 IFPOINT(U%+4,J%-4)=3K%=1
 1700 NEXT
 1710 RETURN
 1720 FORU%=J%TOJ%-(L%*32)STEP-32
 1730 IFPOINT(I%+4,U%-4)=3K%=1
 1740 NEXT
 1750 RETURN
 1760 REM ==START
 1770 DEFPROCstart
 1780 *FX15
 1790 VDU4:PRINTTAB(1,1)SPC35TAB(1,25)SP
C35TAB(1,27)SPC35TAB(1,29)SPC35
 1800 COLOUR1:PRINTTAB(14,1)"BATTLESHIPS
!"
 1810 IFG%=1VDU4:COLOUR1:PRINTTAB(9,25)"
Do you want to go 1st?";:A$=GET$:IFLEFT$
(A$,1)="Y"g%=0:ELSEIFLEFT$(A$,1)<>"Y"g%=
1
 1820 A$=""
 1830 PRINTTAB(9,25)SPC25:VDU5
 1840 FORI%=0TO3:B%(I%)=2:S%(I%)=2:NEXT
 1850 B%(3)=3:B%(4)=3:B%(5)=4
 1860 S%(3)=3:S%(4)=3:S%(5)=4
 1870 BS%=6:YS%=6
 1880 GOSUB2670
 1890 v%=0:D%=1
 1900 ENDPROC
 1910 REM ==YOUR GO
 1920 DEFPROCkeys
 1930 VDU4:COLOUR2:PRINTTAB(16,25)"YOUR
```

➤


10 GOSUB 5000 :END
5000 PRINT "We're LOST!"
5010 lost% = 3 *ducks%
5020 RETURN
Treasure X
LOOK AT THIS.
WHAT'S THAT RETURN AT LINE 5020 ?
FISH FINGER
THAT SIGNALS THE TERMINATION OF THE SUB ROUTINE. THE PROGRAM CONTROL RETURNS TO THE LINE FROM WHERE THE GOSUB WAS CALLED. IN THIS CASE LINE 10 WHERE THE PROGRAM ENDS.
GOSUB
GOSUB
ER... CAPTAIN...
IS THAT A CATAMARAN?
DEFINITELY A CAT – NOT A MERINGUE!
PLURP
MAC

Rom and Ram

➤

```
GO":VDU5:SOUND2,-12,90,1
 1940 X%=960:Y%=640:GCOL3,3:MOVEX%,Y%:PR
INTX$
 1950 REPEAT TT%=TIME+5:REPEAT UNTIL TIM
E>TT%
 1960 IFINKEY(-26)PROCX(-M%,0)
 1970 IFINKEY(-122)PROCX(M%,0)
 1980 IFINKEY(-58)PROCX(0,M%)
 1990 IFINKEY(-42)PROCX(0,-M%)
 2000 UNTILINKEY(-98)ORINKEY(-74)
 2010 IFPOINT(X%+4,Y%-4)=3PROChit:ENDPRO
C
 2020 IFPOINT(X%+4,Y%-4)<>0SOUND1,-12,90
,1:GOTO1950
 2030 GCOL0,2:MOVEX%,Y%:SOUND1,4,50,1:PR
INTCHR$234
 2040 PROCw(50)
 2050 GCOL3,3:MOVEX%,Y%:PRINTX$
 2060 ENDPROC
 2070 REM ==MOVE X
 2080 DEFPROCX(x%,y%)
 2090 IFX%+x%=1216ORX%+x%=704ENDPROC
 2100 IFY%+y%=896ORY%+y%=384ENDPROC
 2110 MOVEX%,Y%:PRINTX$
 2120 X%=X%+x%:Y%=Y%+y%
 2130 MOVEX%,Y%:PRINTX$
 2140 ENDPROC
 2150 REM ==YOU HIT BEEB
 2160 DEFPROChit
 2170 W%=0
 2180 C%=16
 2190 J%=Y%-4
 2200 FORI%=X%+8TOX%+16STEP4
 2210 J%=J%-4
 2220 C%=C%/2
 2230 IFPOINT(I%,J%)=3W%=W%+C%
 2240 NEXT
 2250 GCOL0,1:MOVEX%,Y%:VDU235:GCOL0,2:V
DU8:PRINTX$
 2260 REM ==HIT SOUND
 2270 SOUND0,-15,7,10:SOUND1,2,50,10
 2280 IFW%=4B%(0)=B%(0)-1
 2290 IFW%=10B%(1)=B%(1)-1
 2300 IFW%=12B%(2)=B%(2)-1
 2310 IFW%=2B%(3)=B%(3)-1
 2320 IFW%=6B%(4)=B%(4)-1
 2330 IFW%=8B%(5)=B%(5)-1
 2340 FORI%=0TO5
 2350 IFB%(I%)=0SOUND0,-15,7,50:SOUND1,3
,250,50:COLOUR2:GOSUB3110:PROCw(250):COL
OUR0:GOSUB3110:BS%=BS%-1:B%(I%)=-1
 2360 NEXT
 2370 GOSUB2670
 2380 ENDPROC
 2390 REM ==BEEBS GO
 2400 DEFPROCbeeb
 2410 VDU4:COLOUR1:PRINTTAB(16,25)"BBCs
GO":VDU5
 2420 IFv%=0:P%=RND(15)*32+32:Q%=RND(15)
*32+384:IFPOINT(P%+4,Q%-4)=0MOVEP%,Q%:SO
UND1,1,50,1:GOSUB3040:ENDPROC
 2430 IFv%=0:IFPOINT(P%+8,Q%-8)=1GOTO242
0
 2440 IFv%=0ANDPOINT(P%+4,Q%-4)=2GOSUB24
80:v%=1:OP%=P%:OQ%=Q%:op%=OP%:oq%=OQ%:EN
DPROC
 2450 IFv%>0k%=0:PROCbrain:IFt%=3v%=0:t%
=0:GOTO2420
 2460 ENDPROC
 2470 REM ==CALCS
 2480 w%=0:c%=16:j%=Q%-4
 2490 FORI%=P%+8TOP%+16STEP4
 2500 j%=j%-4
 2510 c%=c%/2
 2520 IFPOINT(I%,j%)=2w%=w%+c%
 2530 NEXT
 2540 GCOL0,1:MOVEP%,Q%:VDU235:GCOL0,2:V
DU8:PRINTX$
 2550 SOUND0,-15,7,10:SOUND1,2,50,10
 2560 IFw%=4S%(0)=S%(0)-1
 2570 IFw%=10S%(1)=S%(1)-1
 2580 IFw%=12S%(2)=S%(2)-1
 2590 IFw%=2S%(3)=S%(3)-1
 2600 IFw%=6S%(4)=S%(4)-1
 2610 IFw%=8S%(5)=S%(5)-1
 2620 FORI%=0TO5
 2630 IFS%(I%)=0SOUND0,-15,7,50:SOUND1,3
,250,50:COLOUR1:GOSUB3120:PROCw(250):COL
OUR0:GOSUB3120:YS%=YS%-1:S%(I%)=-1:v%=0:
D%=1
 2640 NEXT
 2650 GOSUB2670
 2660 RETURN
 2670 VDU4:COLOUR2:PRINTTAB(9,22);YS%;"
"TAB(30,22);BS%;" ":VDU5:RETURN
 2680 REM ==BRAIN
 2690 DEFPROCbrain
 2700 IFv%=1r%=RND(4)-1:D%=r%:v%=2:t%=0
 2710 IFv%=3D%=d%
 2720 IFD%=0 E%=OP%:F%=OQ%+32
 2730 IFD%=1 E%=OP%:F%=OQ%-32
 2740 IFD%=2 E%=OP%+32:F%=OQ%
 2750 IFD%=3 E%=OP%-32:F%=OQ%
 2760
 2770 IFt%=0:IFPOINT(E%+4,F%-4)=0MOVEE%,
F%:SOUND1,1,50,1:GOSUB3040:v%=1:ENDPROC
 2780 IFt%=1:IFPOINT(E%+4,F%-4)=0MOVEE%,
F%:SOUND1,1,50,1:GOSUB3040:GOSUB2840:OP%
=op%:OQ%=oq%:ENDPROC
 2790 IFt%=1:IFPOINT(E%+4,F%-4)=1GOSUB28
40:OP%=op%:OQ%=oq%:D%=d%:t%=2:GOTO2720
 2800 IFt%=2:IFPOINT(E%+4,F%-4)=1GOSUB28
40:OP%=op%:OQ%=oq%:D%=RND(4)-1:OP%=op%:O
Q%=oq%:t%=3:ENDPROC
 2810 IFPOINT(E%+4,F%-4)=1D%=(D%+1)MOD4:
k%=k%+1:IFk%<5GOTO2720ELSEIFk%>4t%=3:END
PROC
 2820 IFPOINT(E%+4,F%-4)=2P%=E%:Q%=F%:GO
SUB2480:d%=D%:t%=1:OP%=E%:OQ%=F%:IFv%>0v
%=3
 2830 ENDPROC
 2840 IFd%=0d%=1:RETURN
 2850 IFd%=1d%=0:RETURN
 2860 IFd%=2d%=3:RETURN
 2870 IFd%=3d%=2:RETURN
 2880 REM ==END OF GAME
 2890 DEFPROCend(M$)
 2900 G%=G%+1
 2910 VDU4:COLOUR2
 2920 PRINTTAB(16,25)M$
 2930 PRINTTAB(8,27)"Press SPACE to play
 again"
 2940 IFYS%=0VDU19,3,11;0;
 2950 REPEATUNTILGET=32
 2960 VDU20
 2970 COLOUR0
 2980 PRINTTAB(16,25)SPC8TAB(8,27)SPC25
 2990 IFg%=1g%=0:ENDPROC
 3000 IFg%=0g%=1:ENDPROC
 3010 ENDPROC
 3020 *FX4
 3030 END
 3040 FORI=1TO3
 3050 GCOL0,1:VDU234,8
 3060 PROCw(10)
 3070 GCOL0,0:VDU234,8
 3080 PROCw(10)
 3090 NEXT
 3100 GCOL0,1:VDU234:RETURN
 3110 VDU4:PRINTTAB(16,25)"Arrrrr!":VDU5
:RETURN
 3120 VDU4:PRINTTAB(16,25)"Got you!":VDU
5:RETURN
 3130 *TAPE
 3140 FORI%=0TO TOP-PAGE STEP4
 3150 I%!&E00=I%!PAGE:NEXT
 3160 ?&13=?&13-(PAGE-&E00)DIV256
 3170 PAGE=&E00:RUN
```

TAKE IT EASY

If you would like to save the wear and tear on your fingers you'll find this listing – together with all the others from this issue – on this month's disc, sent free if you subscribe to *The Micro User*

Get it right

```
  10 =    0 0     650 = 7A3A 1    1290 = AD76 9    1930 = 5CA9 9    2570 = 1618 E
  20 =    0 0     660 = 11B5 7    1300 = ED0F 5    1940 = 67B2 F    2580 = CAC9 9
  30 =    0 0     670 = A493 F    1310 =    0 5    1950 = F34B 4    2590 =  679 2
  40 = C822 2     680 = 5EC5 7    1320 = 6887 4    1960 = 918D 3    2600 = B60B 3
  50 = 4A75 1     690 = C262 F    1330 = 6CC4 8    1970 = CD9C 7    2610 = 4FF6 1
  60 = AC7D B     700 = B5BD 3    1340 = ED0F 8    1980 = 1701 0    2620 = E8E8 D
  70 = 6292 4     710 = 979C 2    1350 = D30B A    1990 = F9A0 1    2630 = 6FF7 7
  80 = CA52 7     720 = 9814 7    1360 = 22B1 F    2000 = E086 D    2640 = 2C83 B
  90 = 5787 9     730 = 699E 6    1370 = 2EA3 D    2010 = 1F3F 2    2650 = 5672 6
 100 =    0 9     740 = CB0D 9    1380 = 6B46 9    2020 = 9E73 7    2660 = 6E17 9
 110 =    0 9     750 = 39F4 6    1390 =    0 9    2030 = E581 E    2670 =  C45 A
 120 = D3E0 0     760 = F28E D    1400 = ED72 4    2040 = 4CA8 0    2680 =    0 A
 130 = B70A 4     770 = 8EE1 D    1410 = B956 B    2050 = 63FE 6    2690 = D35B 8
 140 = EA3A 0     780 =   B2 B    1420 = 2C83 A    2060 = ED0F 0    2700 = 11FD D
 150 = 5109 2     790 = CF05 C    1430 = 6E17 7    2070 =    0 0    2710 =  40F 3
 160 = 79CE 8     800 = 2DB3 0    1440 = C6BD 9    2080 = 61E8 2    2720 = 4F90 6
 170 = C9CA F     810 = ED0F 6    1450 =  617 5    2090 = E254 4    2730 =  D01 9
 180 = ABC2 8     820 =    0 6    1460 = 2C83 A    2100 = 1DD0 E    2740 = 71CC F
 190 = 2C83 D     830 = 9DBA C    1470 = 6E17 9    2110 =  28B C    2750 = F242 7
 200 = F716 2     840 = F56B B    1480 =    0 9    2120 = CEDC C    2760 = D1AD 8
 210 = DEBB 2     850 =  35A 7    1490 = 7E22 B    2130 =  28B 8    2770 = B924 B
 220 = BFBA 8     860 = 9A37 E    1500 = F6E9 8    2140 = ED0F A    2780 = 2BED 4
 230 = F3CE 6     870 = 667A E    1510 = 236D D    2150 =    0 A    2790 = 119E 6
 240 = 4453 7     880 = E8E8 F    1520 = BC2F 5    2160 = D9D6 9    2800 = 5E97 E
 250 = EC41 D     890 = A1A7 7    1530 = FA14 E    2170 =  CBA 4    2810 = 8985 6
 260 = 9193 7     900 = 6BE0 B    1540 = 4D31 B    2180 = 9374 5    2820 = BABA C
 270 = 5472 D     910 = 4944 7    1550 = 5273 7    2190 = 9828 4    2830 = ED0F A
 280 = 1549 5     920 = 7A3D A    1560 = 423F E    2200 = A80A B    2840 = 2076 9
 290 = 33AD 0     930 = 941F 6    1570 = ED36 9    2210 = 1853 8    2850 = AF27 6
 300 = B962 3     940 = 353C E    1580 = B27E 5    2220 = C64C B    2860 = 2EF5 3
 310 = 64B0 4     950 = E848 1    1590 = 14D0 9    2230 = 9325 C    2870 = A1A4 A
 320 = 948A F     960 = D3E4 D    1600 = 582F 0    2240 = 2C83 1    2880 =    0 A
 330 = 8BD7 2     970 = 39B1 8    1610 = E725 5    2250 = EDAB 1    2890 = 3849 B
 340 = 2E78 B     980 = 2C83 8    1620 = A68A 7    2260 =    0 1    2900 = 31DC B
 350 = CDE0 C     990 = ED0F 4    1630 = D339 6    2270 = AB19 0    2910 = 63A3 6
 360 = 9D5F 6    1000 =    0 4    1640 = F4D6 A    2280 = C7C2 B    2920 = 1C76 D
 370 = 8821 3    1010 = 2F29 4    1650 = 2C83 9    2290 = 3F0A C    2930 = 6A1D A
 380 = 3251 8    1020 = F34B 9    1660 = ED0F B    2300 = E3DB C    2940 = E320 F
 390 =    0 8    1030 = 9FEF 4    1670 =    0 B    2310 = E6B6 E    2950 = 5B81 8
 400 = BFBA C    1040 = EDB6 B    1680 = CB11 E    2320 = 56C4 A    2960 = D9A4 3
 410 = D03D A    1050 = 372B 2    1690 = DA89 E    2330 = AF39 8    2970 = F968 A
 420 = 15F8 3    1060 = F7C2 A    1700 = 2C83 C    2340 = E8E8 F    2980 = A64D 5
 430 = B0B6 6    1070 = 2747 9    1710 = 6E17 7    2350 = 32AF E    2990 = 5310 C
 440 = 15F8 0    1080 = 47EF E    1720 = B3DE A    2360 = 2C83 1    3000 = DC41 E
 450 = B3DB 5    1090 = 320E 0    1730 = B6DA 1    2370 = 5672 C    3010 = ED0F 7
 460 = B8BC 2    1100 = 582F 1    1740 = 2C83 3    2380 = ED0F 0    3020 =  129 3
 470 = 781A B    1110 = 5BEE 9    1750 = 6E17 C    2390 =    0 0    3030 = FD2E 8
 480 = 26B3 A    1120 =  DB9 A    1760 =    0 C    2400 = ED38 6    3040 = 8AA2 2
 490 = 82E7 C    1130 = B2F7 D    1770 = 363B 5    2410 = 4642 1    3050 = DE9C 9
 500 = 53CE 1    1140 = DDB2 6    1780 = A022 8    2420 = E8FC D    3060 = 9068 7
 510 = A022 1    1150 = 8F7E 1    1790 = 48CC 3    2430 = 51F0 F    3070 = 994F 8
 520 = B6CF C    1160 = ED0F 0    1800 = 6FC5 8    2440 = 2463 1    3080 = 9068 1
 530 = FD2E A    1170 =    0 0    1810 = 4B1C B    2450 = D8CE 2    3090 = 2C83 0
 540 =    0 A    1180 = 6F8A 8    1820 = A5D6 7    2460 = ED0F 0    3100 = AE05 C
 550 = BB8B 7    1190 = ECC4 5    1830 = 24FF E    2470 =    0 0    3110 = BEF9 7
 560 =  32F E    1200 = FA0F 3    1840 = 73B5 2    2480 = 6E52 C    3120 = 483E C
 570 = B552 9    1210 = 225F 5    1850 = CCCE 3    2490 = 200F D    3130 = CD93 E
 580 = FE05 B    1220 = E2E0 5    1860 = F6DF 8    2500 = 41EB E    3140 = E402 A
 590 = ED0F 6    1230 = 7B62 8    1870 = 3948 3    2510 = 9FF4 A    3150 = A774 C
 600 =    0 6    1240 = 7A3D F    1880 = 5672 C    2520 = 2054 2    3160 = A805 C
 610 = 344C 6    1250 = 2F88 2    1890 = 882E 5    2530 = 2C83 B    3170 = 7290 8
 620 =  73C 0    1260 = AD76 3    1900 = ED0F C    2540 = 2336 7
 630 = 4731 F    1270 = CE0C A    1910 =    0 C    2550 = AB19 F
 640 = 9AD2 F    1280 = 2F88 9    1920 = 5A41 D    2560 = 270D B
```

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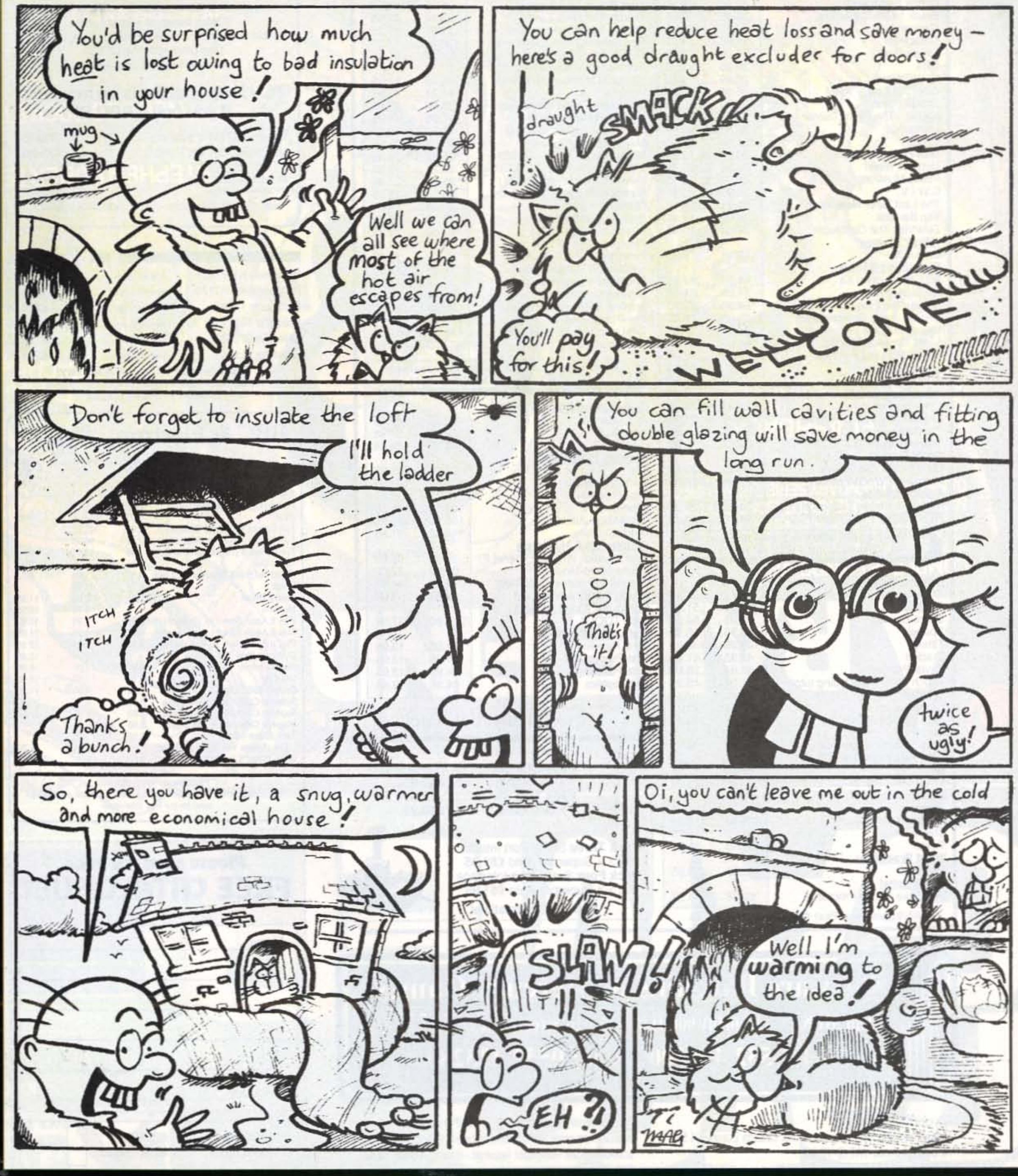
MU 82

The Safe


You'd be surprised how much heat is lost owing to bad insulation in your house!
mug
Well we can all see where most of the hot air escapes from!
You can help reduce heat loss and save money - here's a good draught excluder for doors!
draught
SMACK
You'll pay for this!
WELCOME
Don't forget to insulate the loft
I'll hold the ladder
ITCH ITCH
Thanks a bunch!
You can fill wall cavities and fitting double glazing will save money in the long run.
That's it!
twice as ugly!
So, there you have it, a snug, warmer and more economical house!
SLAM!
EH?!
Oi, you can't leave me out in the cold
Well I'm warming to the idea!

Scientist

Finding ways to keep your house at an ideal temperature is an ongoing problem for researchers. Now you can carry out your own experiments

Anyone for draughts?

YOU'RE probably in the middle of your summer holiday by now, enjoying the sun, sea and surf. We scientists, though, need to keep ahead and start thinking about keeping warm in the winter.

So this month's program is about trying to prevent houses from freezing up in the winter. Mind you, it works just as well for keeping them cool in the summer.

The idea is very simple. A house is being kept at a nice, steady 20 degrees Celsius when the heating fails. The temperature inside will probably start to drop, particularly if it is winter.

When you run the program you must first enter the season of the year. The computer will work out a suitable set of day and night temperatures for that season. This has a random element, just like the real weather.

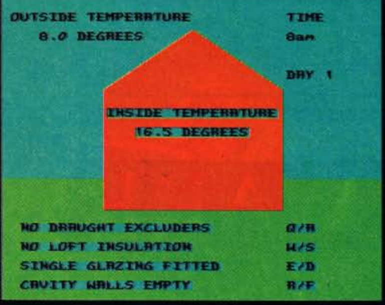
Then, the simulation starts with two hours of time passing by in just a few seconds. Every two hours you get an update on the temperature inside and outside the house. You can see the effect of installing a number of different types of insulation. First of all, you can fit draught excluders around the doors and windows. Then you can put down some insulation in the loft. You can also fill the wall cavity and install double glazing – each at the press of a key.

You could experiment to find out what seems to have the biggest effect. If you are keen on research you could try to find the cost of fitting each type of insulation. You may be able to tell your parents about how to save some money, and earn extra pocket money.

Or you can play the program as a simple game. Select winter and try to keep the house above freezing point (zero degrees). You can rapidly install insulation if it is cold outside, and just as rapidly remove it if the temperature rises.

This is a big area in science. As is often the case with my programs you will be involved in an investigation with no single right answer to find. You will also be learning about energy conservation and, perhaps getting some financial awareness as well.

- That's got this article well wrapped up. Next month we'll reflect on the world of mirrors.



```
OUTSIDE TEMPERATURE                 TIME
   8.0 DEGREES                      8am

                                    DAY 1

              INSIDE TEMPERATURE
                 16.5 DEGREES

 NO DRAUGHT EXCLUDERS               Q/A
 NO LOFT INSULATION                 W/S
 SINGLE GLAZING FITTED              E/D
 CAVITY WALLS EMPTY                 R/F
```

```
   10 REM House Insulation
   20 REM The Safe Scientist
   30 REM (c) The Micro User
   40 MODE1
   50 VDU23,1,0;0;0;0;
   60 PROCoptions
   70 PROCbground
   80 PROCsetup
   90 PROCrun
  100 END
  110 DEFPROCsetup
  120 @%=&02010A
  130 DIM OT%(12),T$(12)
  140 DE%=0:LI%=0:DG%=0:CW%=0:DY%=0
  150 FORN%=1TO12:READ OT%(N%):OT%(N%)=O
T%(N%)+S%:NEXT
  160 DATA0,2,4,6,8,10,10,8,6,4,2,0
  170 FORN%=1TO12:READ T$(N%):NEXT
  180 DATA 6am,8am,10am,noon,2pm,4pm,6pm
,8pm,10pm,midnight,2am,4am
  190 IT=20
  200 E%=4
  210 ENDPROC
  220 DEFPROCrun
  230 COLOUR0
  240 REPEAT
  250 DY%=DY%+1:DY$=STR$(DY%):PRINTTAB(3
0,8);"DAY ";DY$
  260 FORN%=1TO12
  270 PRINTTAB(6,4);SPC(3)TAB(30,4);SPC(
8)TAB(4,4);SPC(13)TAB(14,14);SPC(12)
  280 PRINTTAB(30,2)"TIME"TAB(30,4);T$(N
%)
  290 PRINTTAB(1,2)"OUTSIDE TEMPERATURE"
TAB(4,4);OT%(N%);" DEGREES"
  300 PRINTTAB(11,12)"INSIDE TEMPERATURE
"TAB(14,14);IT;" DEGREES"
  310 D%=IT-OT%(N%)
  320 IT=IT-D%/E%
  330 TIME=0:REPEAT
  340 IF INKEY-17 AND DE%=0 DE%=1:E%=E%+
2:PRINTTAB(2,24)"DRAUGHT EXCLUDERS FITTE
D"
  350 IF INKEY-66 AND DE%=1 DE%=0:E%=E%-
2:PRINTTAB(2,24)"NO DRAUGHT EXCLUDERS
 "
  360 IF INKEY-34 AND LI%=0 LI%=1:E%=E%+
2:PRINTTAB(2,26)"LOFT INSULATION FITTED"
  370 IF INKEY-82 AND LI%=1 LI%=0:E%=E%-
2:PRINTTAB(2,26)"NO LOFT INSULATION
 "
  380 IF INKEY-35 AND DG%=0 DG%=1:E%=E%+
1:PRINTTAB(2,28)"DOUBLE GLAZING FITTED"
  390 IF INKEY-51 AND DG%=1 DG%=0:E%=E%-
1:PRINTTAB(2,28)"SINGLE GLAZING FITTED"
  400 IF INKEY-52 AND CW%=0 CW%=1:E%=E%+
1:PRINTTAB(2,30)"CAVITY WALLS INSULATED"
  410 IF INKEY-68 AND CW%=1 CW%=0:E%=E%-
1:PRINTTAB(2,30)"CAVITY WALLS EMPTY    "
  420 UNTILTIME>200
  430 NEXT
  440 UNTIL0
  450 ENDPROC
  460 DEFPROCbground
  470 VDU19,2,2;0;19,3,6;0;
  480 COLOUR131:CLS
  490 GCOL0,2:MOVE0,0:MOVE1279,0:PLOT85,
0,400:PLOT85,1279,400
  500 GCOL0,1:MOVE340,300:MOVE940,300:PL
OT85,340,700:PLOT85,940,700:MOVE640,900:
PLOT85,340,700
  510 COLOUR0:PRINTTAB(30,24)"Q/A"TAB(30
,26)"W/S"TAB(30,28)"E/D"TAB(30,30)"R/F"
  520 PRINTTAB(2,24)"NO DRAUGHT EXCLUDER
S"TAB(2,26)"NO LOFT INSULATION"TAB(2,28)
"SINGLE GLAZING FITTED"TAB(2,30)"CAVITY
WALLS EMPTY"
  530 ENDPROC
  540 DEFPROCoptions
  550 PRINTTAB(2,2)"SELECT A SEASON"
  560 PRINTTAB(4,4)"A ..... WINTER"TAB(6
,6)"B ..... SPRING"TAB(8,8)"C ..... SUMM
ER"TAB(10,10)"D ..... AUTUMN"
  570 REPEAT:G=GET:UNTILG>64 AND G<69
  580 IF G=65 S%=-4-RND(6) ELSE IF G=66
S%=2-RND(4) ELSE IF G=67 S%=8+RND(8) ELS
E IF G=68 S%=3+RND(4)
  590 ENDPROC
```

Get it right

```
 10 =    0 0    80 = 81CC 8   150 = 12C6 8   220 = A811 3   290 = A6E5 3   360 = 19A5 8   430 = 2C83 4   500 =  7EE A   570 = 5C8C 6
 20 =    0 0    90 = BE89 0   160 = D4F5 D   230 = F968 D   300 = 9BB4 C   370 = B6CA A   440 = 53CE 3   510 =  789 A   580 = 5BD9 5
 30 =    0 0   100 = FD2E A   170 = CB32 1   240 = BFBA 6   310 = F3C1 4   380 = 3CCE 5   450 = ED0F 1   520 = A915 0   590 = ED0F 6
 40 = EA3A A   110 = 2AA8 5   180 =  653 6   250 = 9A3E 6   320 = 1F35 D   390 = 877E 2   460 = 88EB 0   530 = ED0F 1
 50 = 8EF3 0   120 = 99AC 1   190 = D48E 6   260 = 2103 B   330 = 189D 1   400 = 50F5 3   470 = A455 6   540 = BC4C 2
 60 = 51EA 9   130 = F5F3 1   200 = BAF1 7   270 = B207 0   340 = 2700 B   410 = 8337 C   480 = 2149 1   550 = 8C84 4
 70 = 654D 3   140 = 3172 B   210 = ED0F F   280 = E3DF 2   350 = 3529 8   420 = 4594 6   490 = 69EA E   560 = DCA7 6
```

Acorn Portable Computer

Archive magazine published full technical details of the newly-launched Acorn Portable Computer in its July issue. If you missed out on that by not being a subscriber to our magazine, we would be happy to send you a reprint of the article.

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- ☆ Latest software includes built in print routines. (Existing owners please contact us for a free update).
- ☆ Hard locking synchronising circuits for best results from video recordings.
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- ☆ Free seven day trial.

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new Virus Protection Scheme new

Viruses are unfortunately now becoming a serious problem on Archimedes computers and at the present time at least seventeen families of virus have been isolated and each family has different variant strains. The effects of the viruses vary from being fairly innocuous messages to potential loss of data and program files. Network systems can be most seriously affected , but some viruses can easily spread even on floppy disc based systems.

The virus protection software -!KILLER- developed by Acorn Computers, from the basis of Pineapple's virus protection scheme. The software will be continually updated as new viruses are discovered and all registered customers will receive updated versions on a regular basis.

Don't wait until you discover that your Archimedes has caught a virus!!

The cost of the virus protection scheme is just £24.00 + vat for one years protection. Low cost School and County site licences are also available.

Pineapple PAL Coder

The Pineapple PAL Coder is a stand alone unit which provides a coded video signal which can be recorded onto a VHS recorder or fed to a monitor with coded input.

The unit is inserted in the lead to the R G B monitor and provides an R G B output for the monitor together with a full specification PAL coded output. A second version provides a standard coded output but also provides an S-VHS output for improved quality recordings on S-VHS recorders.

Standard Version	£69.00
S-VHS Version	£79.00

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The full auto-route facilities are available even on an un-expanded model 'B' computer. An Archimedes version is available as a free upgrade to existing BBC owners or at a similar price to the BBC version.

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Acorn User - August 88

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Access

PROBLEM SOLVED

Mike Cook helps with another selection of technical questions

On the agenda...
- Compact games
- Combining an A3000 and Electron
- Adding a Compact
- Printer problems
- Mini Office printing
- Colourful screens

Printer posers

I HAVE just purchased a Canon BJ10-ex bubble-jet printer, which I am assured will work with my son's BBC B. However, despite an appropriate lead – 26-pin to 36-pin centronics – from Tandy, both of us are unable to get the computer and printer to communicate with each other. Is this an irrevocable marriage breakdown, or can we save it? – **V.G. Hughes, Eccleshall, Stafford.**

● *First the good news. Yes, the BJ10 printer can be used from the BBC model B. The bad news is that you have been sold a duff connector. Tandy are notorious for not knowing the difference between their own computers and the BBC.*

The problem is with the busy and acknowledge signals. Tandy systems use the busy line where the BBC uses the acknowledge line. Most likely these signals have been swapped in the cable you have. On a centronics connector busy is on pin 11 and acknowledge on pin 10 and you need a signal on pin 19 into the BBC.

No hardcopy

I HAVE a BBC Micro and I am using Mini Office with a Victor daisy wheel printer. Unfortunately, I am experiencing difficulties in getting the printer to respond when using the wordprocessor and database.

I can print the spreadsheet and have no problems with Wordwise Plus, but with the other Mini Office applications when I try to print the paper goes back and forward, stops and prints one line. – **R. Lewis, Clitheroe, Lancs.**

● *Mini Office is really designed for a standard dot matrix printer and as such uses its control codes to product the best results. Unfortunately, these codes are being misinterpreted by your printer or ignored.*

Mini Office has these commands built-in to make it much easier to use than Wordwise but in your case it does have the disadvantage of incompatibility. I'm afraid there's little that can be done.

Revitalising the Compact

IS IT possible to implement the standard Compact 3.5in drive as a second drive on my A3000? I have recently upgraded from my somewhat defunct Master Compact to a dazzling BBC A3000.

If so what extra components will be required, will my desk resemble a plate of spaghetti or can the drive be fitted into an existing housing such as those sold by Pres?

Are there any other bits from the Compact I could use – chips, serial port and so on – or should I convert them all into earrings for my girlfriend? – **Simon Dent, Bath, Avon.**

● *Electrically it is possible to fit your old Compact drive into the A3000. All you need is a lead that contains another IDC connector in the centre. Then you need to change the identity of your original disc to disc 1 by changing a link.*

Finally you need to remove the bus terminating resistor pack from the internal drive. As you have hinted the real problem is where the drive is to be fitted.

You can opt for the spaghetti option, fit it in its own case or go for a

➤

Monitoring the drive on a Master 128

LOOKING through some old copies of *The Micro User* I became interested in the disc drive monitoring unit featured in the Body Building article in the April 1990 issue.

I have a BBC Master 128 and a single-sided 40/80 switchable disc drive and I was hoping to connect one of these monitoring units to my disc drive. Unfortunately, I don't know much about electronics and I am unable to understand how this connects to my disc drive.

Neither am I sure of how to get the 5v to power this as my disc drive uses auxiliary power output and I have a mouse connected to the user port.

I would be very grateful if you could tell me how I could make such a unit which includes LEDs to show write protect, direction, writing, track zero, head position and whether my disc is switched to 40 or 80 tracks.

Finally have you designed one of these monitoring units for printers? If you have could you send me some details? **– Edward Rees, Thronbury, Bristol.**

● *Body Building articles are written for a very wide audience and as such are more demanding than some other features. Many people are not happy about delving inside their computer and so many projects are designed to be simply plugged in.*

Occasionally the only way to perform a project is to delve inside the computer and that does require some skill with electronics. The April '90 article on the disc monitor was one such case and on these occasions the articles are written so as not to tempt absolute beginners to mess up their computers.

For example, the logic chips I used did not show any power supply connections as I expect anyone competent enough to tackle that project will know enough to do this themselves.

Therefore, what you need to do is to first become familiar with electronics and construction and many good books can help you with this. Then tackle some of the more focused Body Building projects. An SAE to Musbury Consultants will produce a list of these.

As to the disc monitoring article, I do say how to tap into the disc signals in paragraph three on page 82. You can easy get a power supply from a splitter plug from the auxiliary supply or by tapping into the 5v line that goes to your drive. Alternatively, if you are mounting the lights in your disc case you can get the power from the drive board.

With regard to a printer monitor, I am not sure there is anything useful to monitor here. All you have is eight data lines, a very fast strobe pulse and an acknowledge line. I suppose you could connect LEDs to the data lines but the transfer is so fast that they would not appear to flash but to dim slightly when the data was being sent.

HELP

racking system like the Watford Ultimum. The rest of the chips are of little use.

Some years ago when the original operating system on the model B was updated we ran a competition about what to do with the old chip. Out of the printable replies, a toast rack for Cindy *proved to be the winner.*

PROBLEM
SOLVED
HELP

Combining technology

I HAVE only just upgraded to a BBC A3000 after being an Electron user for several years. I was wondering if it is possible for me to connect my old Electron AP3 to my A3000 as a second drive. If so how and how much will it cost?

I am also interested in adding a joystick to my A3000 but I am unsure of the options available. For example, can I add my old Electron Voltmace Twin joystick? – **Geoffrey Willis, Bournemouth, Dorset.**

● *The AP3 is a combined disc drive and interface, and all you need to use it with the A3000 is the actual drive. However, most of the Electron disc drives were single-sided holding about 300k. The A3000 really expects a double-sided drive. Although it will successfully read single sided discs, it can't format them.*

This means that you would only be able to use half the disc and only those that had been formatted on the Electron. In short, it's probably not worth the effort of fitting the drive to your computer.

As to joysticks, you'll have noticed there is nowhere on the A3000 to plug one in. You can get an input/output podule fitted and this indeed will have a socket for your joystick. However, most games will not recognise a joystick fitted here although there is nothing to stop you writing your own software.

Most commercial joysticks for the 32-bit computer such as the Voltmace Delta Cat, plug into the mouse port and require a software patch to be loaded. As you can imagine the hardware to do this is very different from that needed on the analogue port of the 8-bit machines.

VGA monitoring

I WOULD like to use my Compaq VGA Monitor (Model 420) with my Archimedes A300. Is this possible?

I wondered whether changing the plug and re-configuring the desktop would do the trick. However, on my first – and only – attempt it did not work. Have you any ideas? – **J.F. Riby, Ebberston, Yorkshire.**

● *The problem with using a VGA monitor is that it requires a separate line sync and frame sync signal, whereas the A300 produces a single mixed signal.*

Therefore, what you need is a sync separator of the sort described in my Body Building article of May 1990. However, VGA monitors do not work at the standard line frequency so you would be limited to a few multi-sync modes on the A300 like Modes 25 to 28.

This should be no problem for most Risc OS compliant desktop software but most games and specialist software has a habit of changing to modes like Mode 15. Normal monitors and multi-sync models can cope but not VGAs.

MIKE'S TIPS

Despite so-called industry standards it's unusual for peripherals and computers to work together first time. This can cause a lot of heartache if you've just spent several hundred pound and things go wrong.

Always try to see any peripheral working with a computer that's the same as yours.

Sounding out the Electron

IN THE May issue of *The Micro User* you ask if any reader could help P. Wright from St Neots in Cambridge. He needed information on a Sound Expansion Board for the Electron.

Project Expansion from Fareham in Hants produced one which was advertised by Slogger in December 1987 in *Electron User*. It was continually advertised until July 1988.

I know this because I have every copy of *Electron User* from August 1985 to its regrettable demise in July 1990. The company does not exist in Fareham any more but I have some recollection of the people who developed the board joining Slogger. Despite a long search I have been unable to confirm this. I hope that this will be of use though.

As you will have gathered I was the proud owner of an Electron until October 1989 which I upgraded to a Master 128. The Electron is still in service with one of my grandchildren.

Since obtaining the Master it has been upgraded by adding a 3.5in disc drive to the original 5.25in drive and until recently I have been delighted to find that the 3.5in disc version of games and utilities for the Compact all worked without any problems. That is until I obtained a special offer twin pack of Barbarian and Barbarian II in 3.5in Compact disc format.

Barbarian loads OK but does not seem to run properly in Combat to Death with two players, but runs a never-ending game, clocking up scores of over 999,999 then starting at 000000 again. The joystick option doesn't work either.

Barbarian II loads to the option screen but on selecting an option it starts loading for about two sectors, prints four characters on the screen and stops loading.

I returned it to the shop and it was exchanged, but the replacement behaves in the same way. Have you any idea why Compact software should not run on a Master. Is any fix available like the Acorn Convert of which I have version 10 and 03? – **J. Darlington, Locksheath, Hants.**

● *Thanks for the information regarding the Electron sound system. As to the problem of Compact software not working on a Master this can be due to two reasons. First of all the joystick on the Compact was in fact a digital model that in effect connected to the user port whereas on the Master it was an analogue joystick connected to an A/D converter.*

The system software made the ADVAL command work the same on both machines but most games talk directly to the hardware for the speed and hence the incompatibility. This also applies to certain functions like screen memory, operating system calls and timers. If everything is done through Acorn approved calls there should be no problems but these are just too slow for most games

Video ULA chip

I HAVE a BBC Model B that has recently failed. When I switch on it usually responds as normal and then puts rubbish all over the screen – apparently random characters in various colours, some of them flashing.

It doesn't respond to the keyboard, the Caps Lock and Shift Lock lights may be lit and the symptoms are not cleared with Break or Control+Break. Sometimes at power-on the cassette motor light comes on and I can hear the relay clicking.

The machine is an Issue 3 with Basic 1, OS 1.2 and Acorn 0.9 DFS. If I can repair it fairly cheaply I would like to but would prefer to save serious money for the A3000 which I also own. – **Anthony Hilton, Leeds.**

● *What's most likely gone is the Video ULA chip which is easily replaceable and you can get them from Watford Electronics for £14 – excluding VAT.*

Bruce Goatly dots the i's and crosses the t's in the last of this series

Finishing the job

SO FAR we've seen how you can use DTP to create documents to your own design. Fine, but if it went only as far as that it would be pointless because no one else would ever see the fruits of your labours.

In this final part of the series we look at printing and duplication – the former for one good copy of the image on paper, and the latter for multiple copies of that.

There are two main sorts of printer you can use for output. The first is the band printer, typified by dot matrix and inkjet/bubblejets. Their advantages are that they are reliable, relatively inexpensive to buy and run, and can give quite good quality results. Inkjets and bubblejets are becoming increasingly popular as alternatives to lasers.

Band printers do, however, have disadvantages. They can be very slow and may give streaky results because each page is printed as a series of individual bands – hence the name.

A new dot matrix ribbon gives its best for only a short time, after which the printing starts to go grey. The 9-pin dot matrix models are cheaper than the 24-pin but correspondingly are much slower.

It isn't all that expensive to buy new ribbons, but if you do a lot of printing you can re-ink them several times before the cloth wears out – *The Micro User* is running a special offer on a ribbon refresher spray.

KEY TIP

Always discuss your needs and intentions – and what you should be providing – with your chosen printing firm, because as a rule they prefer to give advice beforehand rather than have confrontations afterwards.

Inkjet printers don't have ribbons so the quality stays very good until the ink is finished and they are much quieter than the dot matrix ones.

The other type is the page printer. This outputs whole pages at one time straight from computer memory and the only examples are laser printers.

The Archimedes LaserDirect was the first machine to provide a higher resolution than normal – 600 dpi rather than 300 dpi – at a price within the reach of normal individuals – around the £1,000 mark.

The advantage of the Archimedes and the so-called direct drive printers is that with the fast ARM processor and 2Mb or 4Mb of memory the micro can run ahead of the printer, store several pages in memory and then return control to you while the printer finishes off. Lasers, however, are fairly expensive to run as well as being much dearer to buy.

The different outputs from these printer types are shown in Figure I, with an enlargement of a sample letter printed with each. Samples of an area of tint are also shown, demonstrating the different apparent densities of the same grey shade from different printers.

Printer drivers

Just connecting your Archimedes to a printer isn't enough – you need to tell the micro what sort of printer it is.

This, basically, is what a driver does. There are various general or specialised drivers which correspond to the different types and makes of printer available.

The four standard drivers supplied by Acorn are PrinterDM, Printerlx, PrinterLJ and PrinterPS. The first three are for the band-printer types of dot matrix, Integrex inkjet and Hewlett-Packard LaserJet.

The fourth is a PostScript driver and converts the document to a form that can be understood by any printer – including very high-quality professional ones – that use the page description language called PostScript.

The most important thing about a printer driver is, of course, to make sure that it is set up correctly. For the sake of simplicity we'll look at the Acorn dot matrix options, though the principles hold good for other types.

Loading the PrinterDM application – the current version of all Acorn drivers is 2, available as an upgrade from your dealer – installs the printer icon on the icon bar. If you click Select on the icon you call up a dialogue box and from here you can change the options that relate to different dot matrix printers.

You may also be able to alter the resolution of printing by clicking on the Printer type writable icon – some types have more than one entry, allowing you to choose low resolution for draft output.

This is much faster and saves ribbon wear, though not paper and means that you can switch to high resolution for the final high-quality printout.

You can find out more about the printer options by reading the Help file in the application's directory, reached by holding down Shift while double-clicking on the application's file icon.

Clicking Menu on the driver's icon bar icon calls up the main menu, with options for choosing the major class of printer – Parallel, Serial, Econet, NFS or File. There's also another for you to define up to four preset page sizes which you can then save so they load up every time with the driver.

Once you've set up the printer driver you can choose Quit from the main menu. This has three effects:

- The icon disappears from the icon bar

➤

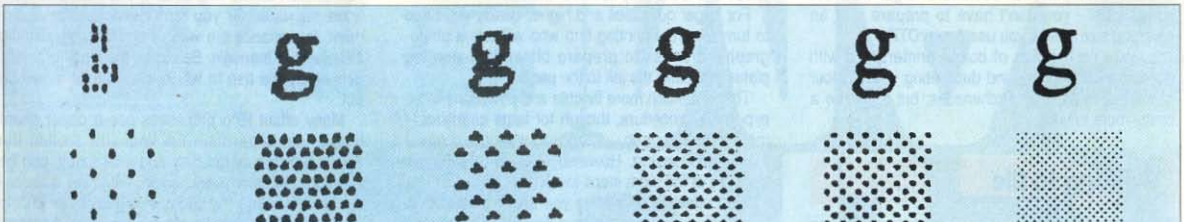

Figure I: Outputs from various printer types, shown enlarged – dot matrix (60 and 180 d.p.i.), inkjet (150 and 300 d.p.i.) and laser (300 and 600 d.p.i.)

> *'The most important thing about a printer driver is, of course, to make sure that it is set up correctly'*

➤

- The memory used by the driver application is released and can be reused
- The driver module will still print out quite contentedly but the settings will be fixed until you reload the application.

Camera copy

Camera copy is simply a flashy name for the image that will be used for duplication. Mostly it will be on paper, though photographic paper is used in professional work.

If you're making the camera copy yourself take some care in preparing it to get the best image, because even the finest photographic equipment can't reproduce well a poor-quality original.

The first thing is to match the paper to your printer, even by trial and error. Dot-matrix printers need a slightly absorbent surface to avoid smudging, whereas inkjets give the best results with slightly shiny paper, although you may need to be careful to avoid smearing while the ink is still wet.

Laser printers work well with most photocopier papers and the advantages of special laser printer paper are debatable.

Whatever your printer, maximise the contrast by using as white a paper as possible – the thin fanfold variety for draft dot matrix work is not good enough. Giving your dot matrix a spring clean, and using a fresh ribbon will help too.

To improve the quality of your document beyond your printer's normal capabilities, print at a larger size than the finished document needs to be and ask the person doing the duplicating to reduce it in proportion.

For instance, if you are preparing an A5 page – 148mm by 210mm – you can print it at 141 per cent size on A4 paper – 210mm by 297mm – ready for reduction to 71 per cent during duplication.

What the reduction does is to increase the effective resolution of the image – but watch out for tint areas because the dots might cause problems during reduction.

Impression and Ovation have scale controls for use in printing, so you can choose to output your document larger than the actual size – you don't have to prepare it at an enlarged size unless you use Acorn DTP.

I make no mention of colour printers and with good reason. Printing and duplicating in full colour can be done from an Archimedes, but it can be a costly route to take.

Printing to file

Waiting for a dot matrix or inkjet printer to finish can be boring because most drivers tie up your micro while they are working.

If you have to prepare several documents, each with one or more identical pages, you can output the common parts to disc. All you need is plenty of disc space, and preferably a hard drive.

We saw earlier that File is a class of printer. If you enter a valid filename – such as ADFS::0.$.mydoc or :5.Poster.printout – into the writable icon reached via the File option, anything you print will be sent to that file as a graphic image with a filetype that corresponds to the printer type selected by the driver.

All you then have to do to print the file is change the class back to match your printer and drag the file icon to the icon on the icon bar.

Why bother with this? There are two reasons: Printing to disc is faster than to a band-type, and outputting from a file can be done in the background so you can still use your micro while it does so.

The technique leads conveniently into the subject of PostScript. Unfortunately there isn't space here to deal with its benefits, and a short description of how to prepare a PostScript document would mislead you into thinking it was always straightforward – it isn't.

It's almost the only feasible way of accessing the world of professional-quality reproduction from DTP on the Archimedes, and it's beset with traps for the unwary.

Duplication methods

There are duplication methods to suit all pockets and quantities. The simplest and the cheapest for small quantities is photocopying, which is usually charged at a flat rate per copy. The quality is good enough for very many uses and it's quick enough to be done on the spot. In most High Street print shops this is the only option available.

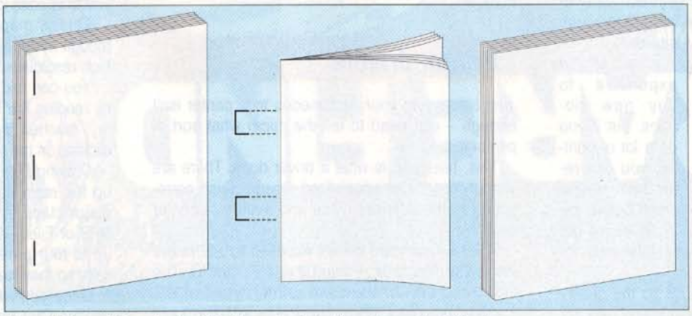

Figure II: Some different sorts of binding – stapled at the side or side stabbed, stapled through the fold or saddle stitched and perfect bound

For larger quantities and higher quality you need to turn to a real printing firm who will use a photographic process to prepare offset litho printing plates that carry the ink to the paper.

This is a much more flexible and potentially more expensive procedure, though for large quantities – more than 100 or so – it tends to work out cheaper than photocopying. However, it does take longer because of the extra steps involved.

With offset litho printing you aren't restricted to black ink as one or more coloured inks can be used. If you want areas of different colour on a page – known as spot colour – you can have it.

Just remember that for each different colour ink the firm will need a separate piece of camera copy – collectively these are called separations – or a tracing paper overlay on each page describing the colours to be used.

The camera copy for spot colour should always be printed in black and each separation must have alignment mark – registration marks – to define the correct positioning of the colours.

Give due regard to the finished look of your document. For instance, the paper you choose is at least as important a design decision as any of the other work you did during the DTP phase.

Glossy paper is dearer but gives a cleaner, more precise finish with an air of quality. Paper colour and thickness play their part too – they are both defined by the sort of document you are producing.

Finishing

Finishing is everything that happens to your document after duplication. Depending on the document type it may be nothing at all, or it may take many steps. The main processes are folding, binding and trimming.

Folding can produce anything from a folded leaflet to a multi-page book, depending on how many pages have been put on to each sheet of paper during duplication. The folding is done by machines, so it's quick and accurate.

The various types of binding that can be used to make brochures, booklets and books are shown in Figure II.

Stapling is secure and durable, but side stabbed documents need a large margin allowance at the bound edge. Perfect binding, where the page edges are glued together, lasts a lot better now than it used to.

Sewn binding, where sheets are folded several times and stitched together, is at the top of the range and costs proportionately more.

A nice cover for a brochure or a book is a good idea if you want to sell it. Use a thin card – all card is known as *board* in the trade – and use contrast between the ink or inks and the board colour to attract attention. You can have the outside of the cover varnished or even plastic coated – laminated – for extra protection.

Some other sorts of binding can be done at home, such as the ring binding often used for software manuals. Or you may need special equipment, for instance the wire or plastic comb binding also used in manuals. Basically, the binding type is defined by the use to which the publication will be put.

Many offset litho processes use a paper sheet that is just larger than the final size so that the edges, which may get dirty and a bit rough, can be trimmed off to give a neat finish. Trimming is essential for separating the pages in a book after folding and binding but for a flat sheet such as a poster you can probably get away without it.

This lightning tour of printing, duplicating and finishing rounds up this series on DTP. It's really only the beginning of the story, as the rest is up to you and your creative talent. Now get publishing!

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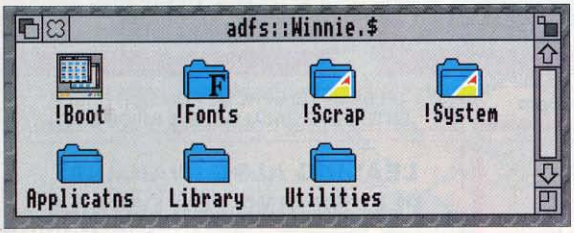
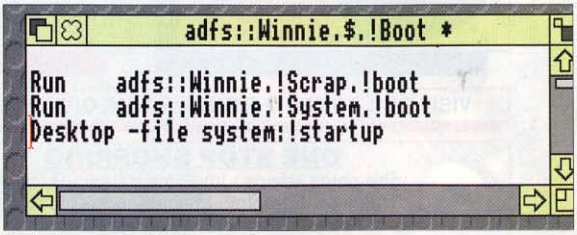


Organising your hard disc



```
Run     adfs::Winnie.!Scrap.!boot
Run     adfs::Winnie.!System.!boot
Desktop -file system:!startup
```

The basic system !Boot file

Personalise your micro

Clem Vogler and Steve Turnbull explore auto-booting from your hard disc

HAVE you bought a hard disc recently? Did the machine you bought have one as standard? Or perhaps you're thinking about getting one?

Apart from giving you room to breathe a hard disc has the added advantage that you can run your favourite software from switch on – but how's it done?

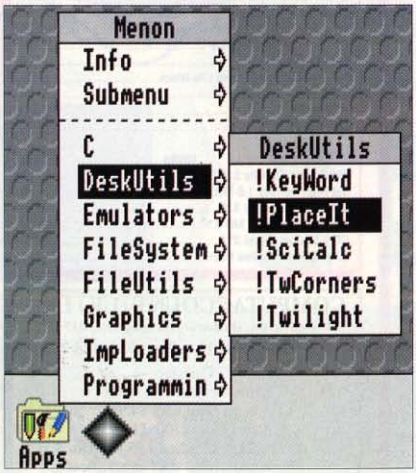
For the moment we'll just examine auto-booting with Risc OS 2 because Risc OS 3 has some convenient added features that complicate things enormously.

The first step is to create a !boot file for your machine. You do this from !Edit. Double-click it and then click Menu on the iconbar icon. From there move to the Create option and slide to the arrow. In the sub-menu that appears is a Command option, click this one.

A normal edit window appears but it will save as a Command file instead of a text file. Click on your hard drive icon and save the Command file – currently empty – with the name !Boot in the directory window that's appeared.

The directory window should also contain your !System directory, the !Fonts directory and a !Scrap directory – if you don't have this one you'll find it on this month's subscription disc.

Although the exact way you organise your hard disc is a matter of taste you may find the following directories useful:



A typical Menon menu

- ***Applicatns.*** This should contain programs like !Paint, !Draw, !Edit and any other complete document editor such as Impression, Ovation, Poster, Illusionist and so on. Any applications that can create and edit documents should be here.
- ***Library.*** This is a special directory which the Filer searches if it's asked to run a program but isn't given the complete path name. Some programs will put routines into the library so that they are easily accessible.
- ***PDrivers.*** It's handy to keep all your printer drivers together.
- ***Utilities.*** This should contain all the programs that perform a particular operation on a file. For example programs that convert from one graphics format to another, provide desktop facilities like backdrops, calculators, file compressors and so on. If you have a lot of utilities they can be subdivided into sections like DeskUtils, GrafUtils and so on.

Piglet
Winnie
Apps

PlaceIt can be very helpful

You can then have other directories containing data and documents relating to your personal needs, perhaps one for correspondence, another for financial matters and so on.

Within the first !boot file you need to initialise the !Scrap and !System directories. All you have to do is click in the Edit window for !Boot then drag both !Scrap and !System and drop them into the Edit window while holding down Shift.

What happens is that the full path and file name of the directories appear in the window. Now add:

```
.!boot
```

to each of the lines. When the commands in this file are obeyed these two lines force the !Boot files of !Scrap and !System to be executed and the directories are initialised.

At the bottom of the file add the line:

```
Desktop -file System:!Startup
```

and make sure there is at least one Return after the line. This command starts up the Desktop and forces another file of commands to be executed.

This file is going to be called !StartUp and located inside the

!System directory. To get at the inside of the !System directory double-click its icon while holding down the Shift key. This will open up to reveal !Boot, !Help and !Run files as well as !Sprites and a Modules directory.

Click on the Edit icon on the iconbar to create a new text file and immediately save it into the !System directory with the name !StartUp. The purpose of this file is to initialise various utilities and applications and perhaps run some of them.

When you double-click a sprite file and the Filer hasn't yet seen !Paint all that happens is that the first sprite of the file is drawn on the screen. This is not very useful and it's just as annoying to have to remember to open your applications directory before double-clicking the file.

In the case of non-Acorn applications the problem is even worse because documents for programs like Easiwriter and Ovation will appear blank as the filetype icons haven't been loaded into the sprite pool.

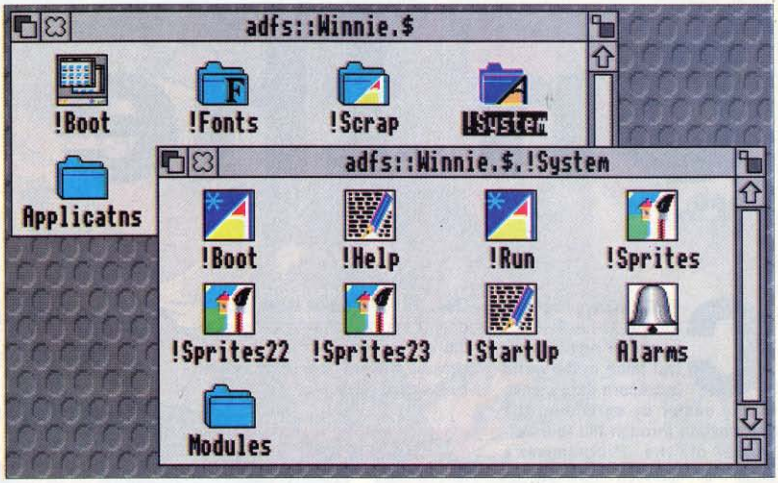
To fix this problem drag the icons of all the applications you want to initialise into the edit window for !StartUp, holding down Shift so that the complete path name is put into the file.

All those programs you actually want to load and run leave as they are – the !Alarm application might be one of these – but if you just want to initialise them add:

```
.!boot
```

to the end. So, for example, to arrange your system to run !Paint when a sprite file is double-clicked, simply drag the !Paint icon into the edit window for !StartUp and add *.!boot* to the end of it.

It's a good idea to initialise your !Fonts directory and you can specify a library too with the LIB command – just drag the directory that's to be the library into the window.



Where to put the !StartUp file

Two common PD utilities that people like to have are !Menon and !PlaceIt. The former allows you to put the names of applications and directories on to a menu for easy selection. You can also have sub-menus for grouping common items.

The advantage of !PlaceIt is that you can have the icons of applications and directories on screen all the time, ready for you to double-click. Using the !StartUp file you can automatically load and run either or both of these – or another one if you have your own preference.

Using !PlaceIt also reduces the number of programs you have to put in the !StartUp file because it automatically runs the !boot file and loads the sprites for any application that's sitting on the Desktop.

Once your !StartUp file has everything in it you need, make sure you save it.

So far so good, but if you press Control+Break it still won't autoboot, there are some configuration items that must be altered.

First up is the default filing system. If you have an ADFS hard disc then that's no problem but if you have an IDEFS or SCSIFS issue this command after pressing F12:

```
Configure FileSystem IDEFS
```

or:

```
Configure FileSystem SCSIFS
```

Then you need to set up which is the default drive. This will normally be drive 4 although not necessarily – especially if you have a SCSI system with lots of hard discs. Anyway the command is:

```
Configure Drive 4
```

The next step is to force the booting to take place with:

```
Configure Boot
```

This tells the default filing system to look for a file called !boot on its default drive and then do something with it. That something can be LOADed, RUN, EXECuted or ignored – in this case we could either run or execute. To ensure we set the boot option on the correct drive enter these commands at the star prompt:

```
ADFS
Drive 4
OPT 4 3
```

Change the first command to whatever filing system your hard disc is on and the second to the correct drive number. Now pressing Control+Break – ensuring you've saved any edit files – should result in your system autobooting.

● *What we have presented here is not the only approach but it's one that works. When you get the feel of it you'll be able to modify it to suit yourself.*

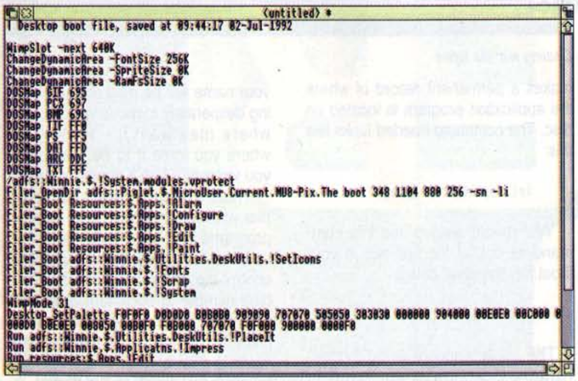
Risc OS 3

As mentioned the new operating system has some clever features to make creating system !boot files even easier. Specifically you can save the current Desktop configuration using the Desktop boot option from the menu on the iconbar Acorn symbol. It also automatically sets the autoboot options.

Every program currently running is then given the opportunity to add information to the desktop file. What is saved depends on the application itself. For example the Filer records all the windows currently open and where they are on screen. If this file is then executed the applications will be run, perhaps loading files as well, windows will be opened where they were and so on.

The main problem with this system is that too much information is recorded and it's worthwhile loading the file into !Edit and going through it deleting unnecessary sections.

Despite the cleverness of this built-in system we've found that the method described in this article for Risc OS 2 actually works very successfully with Risc OS 3 as well, but the extra commands allow the machine to be organised even better.



```
| Desktop boot file, saved at 09:44:17 02-Jul-1992

WimpSlot -next 640K
ChangeDynamicArea -FontSize 256K
ChangeDynamicArea -SpriteSize 0K
ChangeDynamicArea -RamFsSize 0K
DOSMap GIF 695
DOSMap PCX 697
DOSMap BMP 69C
DOSMap TIF FF0
DOSMap PS  FF5
DOSMap DAT FFD
DOSMap ARC DDC
DOSMap TXT FFF
/adfs::Winnie.$.!System.modules.vprotect
Filer_OpenDir adfs::Piglet.$.MicroUser.Current.MU8-Pix.The boot 348 1104 880 256 -sn -li
Filer_Boot Resources:$.Apps.!Alarm
Filer_Boot Resources:$.Apps.!Configure
Filer_Boot Resources:$.Apps.!Draw
Filer_Boot Resources:$.Apps.!Edit
Filer_Boot Resources:$.Apps.!Paint
Filer_Boot adfs::Winnie.$.Utilities.DeskUtils.!SetIcons
Filer_Boot adfs::Winnie.$.!Fonts
Filer_Boot adfs::Winnie.$.!Scrap
Filer_Boot adfs::Winnie.$.!System
WimpMode 31
Desktop_SetPalette F0F0F0 D0D0D0 B0B0B0 909090 707070 505050 303030 000000 904000 00E0E0 00C000 0
000D0 B0E0E0 008050 00B0F0 F0B000 707070 F0F000 900000 0000F0
Run adfs::Winnie.$.Utilities.DeskUtils.!PlaceIt
Run adfs::Winnie.$.Applicatns.!Impress
Run resources:$.Apps.!Edit
```

The typical Risc OS 3 desktop file

On the run

Steve Turnbull reveals more about the essentials of creating your own applications

CREATING applications for the 32-bit Risc OS machines isn't the easiest thing in the world but Acorn didn't make it any easier by spreading the information through the four volumes of the Programmer's Reference Manual.

This time we're looking at start-up programs. Inside an application directory are a number of standard files: !Boot, !Run, !RunImage and !Sprites.

Last month we saw how to build the !Sprites file to display an interesting icon and how you can create a simple !boot file with just the *IconSprites* command.

The !boot file is usually an Obey-type file executed when a directory window is first opened and the operating system sees the application for the first time.

This is why opening up directory window can take a very long time – the Filer is looking at each application directory in turn and checking to see whether it has a !boot file.

If there isn't one the Filer automatically issues the:

```
IconSprites <Obey$Dir>.!Sprites
```

which may result in an error message if that file doesn't exist either.

If the !boot file is there the Filer runs it. So it doesn't have to be an Obey file – it could be Basic, a utility or anything that can be run. However the convention is for an Obey file because it allows other commands to be executed easily.

What's it for?

The idea of the !boot file is to add information about the application to the operating system. This could be as little as which sprite to use for the icon – the !Sprites file – or could include data about file types related to the application, what to do when certain file types are double-clicked or dragged to a printer driver.

!Boot and !Run files are intimately linked with the concept of the *system variable* which allows information about applications to be held in a common area and accessed by a name.

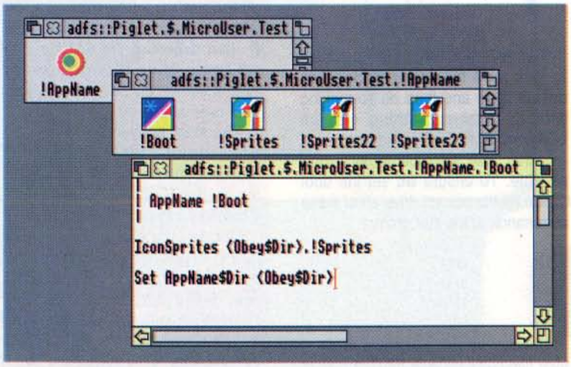
For example when an Obey-type file is run, the Obey module sets up a system variable called *Obey$Dir*. This contains the complete filing system path name of the Obey file currently being carried out. You can check to see the current contents of Obey$Dir by pressing F12 and typing:

```
Show Obey$Dir
```

The filing system path that appears is the location on disc of the last obey file the Obey module executed. By entering:

```
*cat <obey$dir>
```

you can list the directory containing the last Obey file executed. To see all the system variables try typing *Show*.


adfs::Piglet.$.MicroUser.Test
!AppName
adfs::Piglet.$.MicroUser.Test.!AppName
!Boot
!Sprites
!Sprites22
!Sprites23
adfs::Piglet.$.MicroUser.Test.!AppName.!Boot

```
| AppName !Boot
|
IconSprites <Obey$Dir>.!Sprites
Set AppName$Dir <Obey$Dir>
```

The basic !boot file

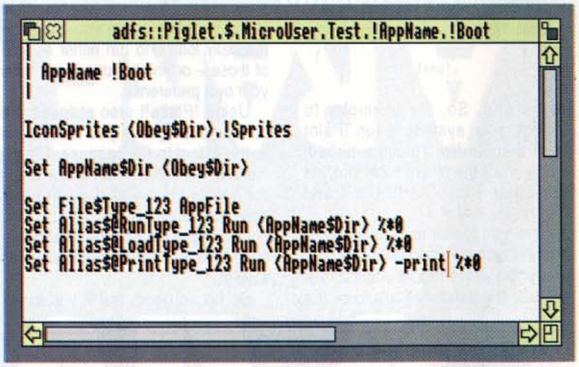
!Boot files use Obey$Dir to create their own system variable which makes a permanent record of where the application program is located on disc. The command needed looks like this:

```
Set AppName$Dir <Obey$Dir>
```

You should always use this command as one of the first two in your !boot file, the other being:

```
IconSprites <Obey$Dir>.!Sprites
```

The importance of using system variables cannot be emphasised enough: If you use them it doesn't matter where your program is – on floppy, hard disc, CD-Rom or whatever. And it won't matter what directory the user puts your application in. The system variable you create – AppName$Dir – will have the right path name so your program will know where it is.



```
| AppName !Boot
|
IconSprites <Obey$Dir>.!Sprites

Set AppName$Dir <Obey$Dir>

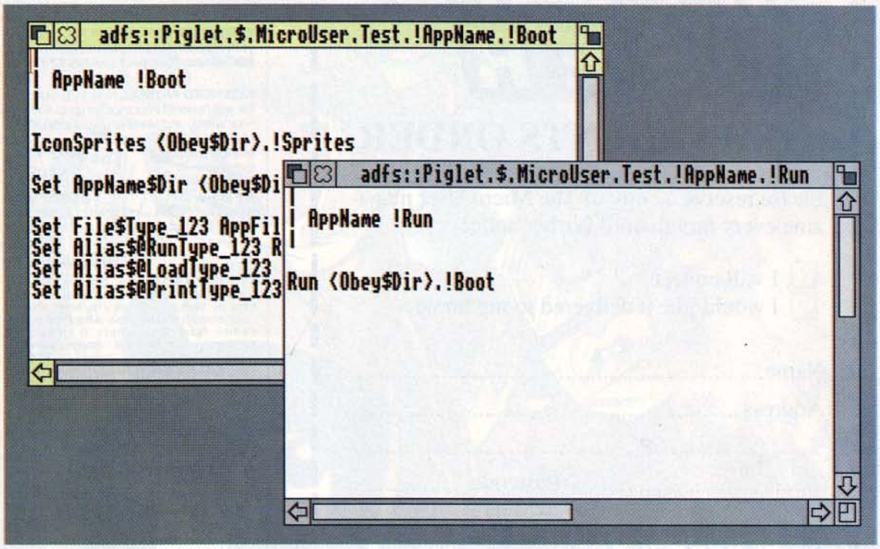
Set File$Type_123 AppFile
Set Alias$@RunType_123 Run <AppName$Dir> %*0
Set Alias$@LoadType_123 Run <AppName$Dir> %*0
Set Alias$@PrintType_123 Run <AppName$Dir> -print %*0
```

Dealing with file types

If you don't use system variables your name will be mud and users trying desperately to move your program where they want it – rather than where you force it to be – will curse you violently when it doesn't work.

There are other system variables that you might need for more complex programs that have documents with specific file types. These variables control the translation from document type number to document type name and what happens when the document is run, loaded or an attempt is made to print it.

In general they look like this:



```
adfs::Piglet.$.MicroUser.Test.!AppName.!Boot
|
| AppName !Boot
|

IconSprites <Obey$Dir>.!Sprites

Set AppName$Dir <Obey$Di

Set File$Type_123 AppFil
Set Alias$@RunType_123 R
Set Alias$@LoadType_123
Set Alias$@PrintType_123
```

```
adfs::Piglet.$.MicroUser.Test.!AppName.!Run
|
| AppName !Run
|

Run <Obey$Dir>.!Boot
```

Accessing !boot from !run can make life easier

```
Set File$Type_XXX MyFile
Set Alias$@RunType_XXX Run
  <AppName$Dir> %*0
Set Alias$@LoadType_XXX Run
  <AppName$Dir> %*0
Set Alias$@PrintType_XXX Type_XXX Run
  <AppName$Dir> %*0 -print
```

The first sets up the text name of a specific filetype, the XXX should be replaced by a hexadecimal number. For example, FFF is a text file, FFE a command (Exec) file, FFD is data, FFC a utility, FFB for Basic, FFA is an absolute address code file and so on.

You can invent a file type by issuing the appropriate command from the star prompt. Press F12 and enter:

```
Set File$Type_123 TestType
```

Now you can create a test file and change its type with the command:

```
Create Fred 1000
SetType Fred TestType
```

There's no icon for this file type so the Filer window will display a white box with a black border for this file.

The next two Alias commands cause the operating system to replace simple run and load commands with slightly more complex versions. So the two commands:

```
Run Fred
Load Fred
```

will both get converted to:

```
Run <AppName$Dir> Fred
Run <AppName$Dir> Fred
```

so the application that Fred belongs to is run and that program can then look to see if it is supposed to load any particular file.

In this case it is, file Fred. This is why double-clicking on a draw file loads up !Draw and then !Draw itself loads up the file that was double-clicked in the first place.

The final Alias command is used by the printer drivers. You can often print files by dragging them from the Filer window on to the printer driver icon.

Text files are usually printed automatically because they are quite simple but draw files, for example, cannot be printed directly, !Draw itself needs to be run.

So the printer driver issues a command:

```
Run <draw$dir> -print Fred
```

!Draw is run then looks at the rest of the command line and discovers it has to print a file called Fred, so it loads Fred and prints it. Some applications might automatically quit after printing the file.

Getting back to the !Boot file for your application you can see now that if there is a particular file type your application can load you should set up system variables for the file type, loading, running and perhaps printing as well.

But you should never replace actions for existing file types. For example let's say your application rotates sprite files through a variety of angles. You could replace the normal Load and Run Alias commands so that they run your application instead of !Paint – but don't.

You should only replace the Alias commands if your application actually performs *all* the functions of the application you're taking over from.

If your application can do all the editing functions that !Paint can do you can replace the Load and Run Alias commands, but if it can't, don't do it.

Instead you have to program it to recognise when the file is dragged on to the application's iconbar icon or into one of its windows.

Essentially that's all !Boot files are for – they just set up the system variables that allow your program to be run when files belonging to it are run, double-clicked or dragged to the printer driver.

If you don't do any of these things there's no need to bother with a !Boot file. But if you have one it will also need the IconSprites command.

Now let's take a quick look at !Run files and how they relate to !Boot files. When an application icon is double-clicked or a run command is issued for it, it's the !Run file that is executed. A couple of special circumstances need to be taken into account:

- The first is if the application is run without the !boot file being run at an earlier time. This means that any system variables won't have been set up and the icons won't have been loaded into the common sprite pool.
- The second is where you've copied the application from one place to another – perhaps from floppy to hard disc. The !Boot file will have been run from the source position so all the system variables will relate to the original version of the application. But perhaps you want to run from the copy.

The solution is the same for both cases: All the information in the !Boot has to be executed again from the !Run file. The usual way of doing this is to copy all the text from !Boot into !Run, but this just adds work especially if you change the !Boot file.

It's much better to make the first thing in the !Run file a command to execute !Boot – Obey files can be nested without causing problems. So all you do is put in this command:

```
Run <Obey$Dir>.!boot
```

This instructs the Obey module to carry out all the commands in the !Boot file in the same directory as !Run – which is exactly what we want. Now all the system variables will changed to refer to the version of the application that has been double-clicked or run.

- *In the next part of this series we'll take a closer look at !Run files and using the WimpSlot command.*

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Steve Bruntlett takes you through a more unusual application

Mapping it out

THE focus of this article is map design and production. General techniques and working procedures are used in this kind of work which may have application in other areas of computer-based graphic design.

There are many uses for maps, including party invitations, treasure hunts, walks, rides, homework, worksheets, posters and designs.

It's not always possible to find up-to-date maps which include new roads, shopping centres and estates. A photocopy with old bits blanked out and new bits drawn in is a standard way to produce a map and, while it may not take as long to draw as a computer-based one, it can quickly look tatty.

Another type of map that can be easily produced is the kind suggesting a *short* five mile walk for Sunday afternoon often found in local papers. It is usually too small to read and falls apart if it starts to drizzle. You could put together a series of walks as simple maps with a few key symbols, stopping points and written instruction.

The most interesting development of this kind of working map is the number of illustrations to be found in Tourist Information Offices.

What to leave in?

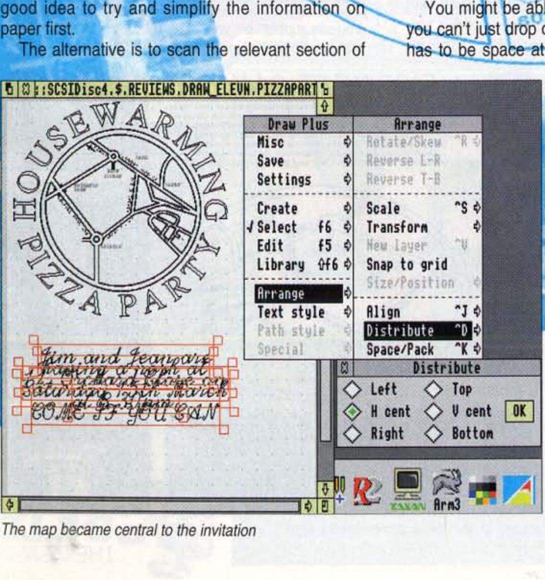
If you can produce a smallish map, try centring it on an A4 page and produce a series of illustrations for the map using either your own DrawPlus drawings, scanned drawings or photographs.

One of the main problems when drawing maps is deciding what to include and what to leave out. Omitting detail can make maps easier to read as well as emphasising important information.

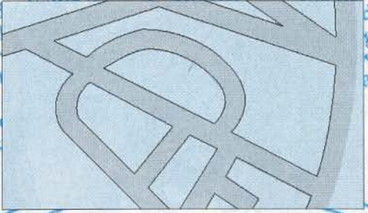
When I was producing my map I wasn't concerned with showing every street name or bend, rather the location in relation to well known roads, features and buildings in the area.

Working from a paper and pencil drawing, for a Pizza Party map I first concentrated on the main road in relation to the village. Starting to work on screen straight away may be tempting but it's a good idea to try and simplify the information on paper first.

The alternative is to scan the relevant section of a map of the area, load that into DrawPlus on Layer 1 and then work over the top of that on Layer 2 turning off the scanned map to monitor progress.



The map became central to the invitation



Start off with the road outlines

As all but one of the roads were single lines it wasn't too much of a problem to draw them and line them up. It's still a good idea to use a Grid Screen setting of a centimetre with a Lock setting of 10 and only turn off the Snap to lock grid option for fine adjustment.

The main road was drawn with a double line for emphasis. You must decide whether all roads will be the same thickness or whether there may be one or two variations.

Drawing a double line might seem straightforward but how can you make sure the lines are parallel, and what happens if there are two such roads meeting at a crossroads or junction?

You might be able to draw the roads parallel but you can't just drop one on top of the other, as there has to be space at the junction of the crossroads. This needs four separate sections which is reasonably easy to draw vertically and horizontally but what about at 30 degrees? Try it and see what I mean.

The most obvious way to produce a crossroads is to draw it at right angles, rotate it and move it into position. This seems reasonable but you don't know if it will be the right size or proportion especially if you're working within a fixed size outline border.

By grouping the elements of the crossroads, rotating the drawing by 30 degrees and drawing an outline box round it, you should see what the problems are in making sure the road elements reach the edge of the map outline accurately while still parallel to each other.

Now ungroup the crossroads and you'll soon realise that you can't scale the components to reach the edges without distortion. Use the Edit options instead.

Select a section and press F5 to enter Edit mode. Press Adjust and you'll see the control points in blue. Now drag these to the edge, but how do you know if the altered lines are still parallel?

One solution is to draw your crossroads on Layer 1, save the drawing, create Layer 2 using the Layers option under the Misc menu and load a copy back on to your drawing at the bottom left hand corner for reasonable alignment. Select Layer 1 and turn the first crossroads to red – your drawing on Layer 2 should still be black.

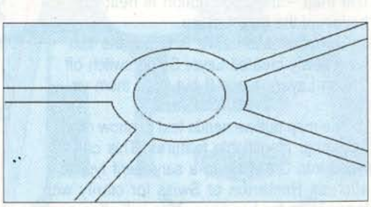
Move the copy over the original so that they are perfectly registered. Now turn off the Sel radio button for the drawing on Layer 1 so it can't be changed but leave the Vis radio button switched on so you can still see it.

Fine tuning the roads

Once the red map on Layer 1 and the current black map on Layer 2 are registered you'll only be able to see the black map. However, if you start editing the map on Layer 2 by moving the line control points you'll soon see the red lines underneath but because that layer isn't selected you won't be able to alter them by mistake.

Move the control points to the edge of the outline box making sure they still cover the underlying red lines and you'll be able to achieve near perfect results.

You may need to do some fine tuning with the Snap to lock grid option reduced or turned off but the underlying map will always give you the basis for accurate parallel lines no matter how far you extend them. This is OK for simple construction but ➤



Roundabouts can be very complex and need to use the layers menu

> *With an underlying structure it's a matter of tracing round the edges*

➤

a more flexible approach is needed for complex outline shapes.

One of the best ways to produce accurate roads is to use a single thick line in a different colour and use that as an underlay for the detailed drawing. This is much more suitable for curved roads and especially useful for complicated map structures such as multi-exit roundabouts.

Trying to draw a roundabout or any other similarly complex shape without an underlying structure is extremely difficult, if not impossible. With an underlying structure it's a matter of tracing round the edges.

Using a grey line of 40pt thickness I constructed a drawing of a basic roundabout with a few exits on Layer 1. This is best grouped into a single object. Layer 1 can be deselected but kept visible and Layer 2 created.

Draw thin black lines round the edges of the road structure but don't bother about curves at this stage. Set the Snap to lock grid setting to 40 for manoeuvrability.

The Edit option will let you move the control points into position, change the straight lines to curves where necessary and move the yellow edit points to produce the curve. Try and keep the edit points equidistant from the control points and the same distance from the grey road edge to produce the smoothest curves.

Once the outline of the road drawing is complete the components can be grouped and thickened to make them visually stronger. The bird's-eye view of the map can be changed to a perspective view by squashing or skewing the drawing.

Roads drawn by outline

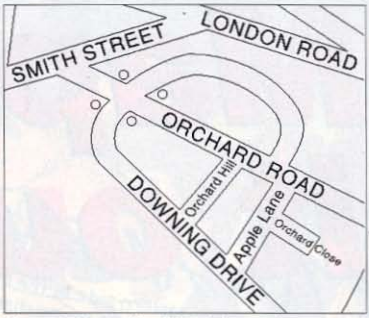
The more complex map drawn for the party was constructed in a similar way with a grey underlying structure drawn first on Layer 1. The outlines of the road were drawn on to Layer 2, moved into position, changed to curves where necessary and edited to fit the road structure.

Once the drawing is complete there should be little difference between the edge of the underlying road structure and its outline. You may have to use small gridlock settings and work at a larger scale to achieve total accuracy but if all else fails thicken the outline to hide any gaps.

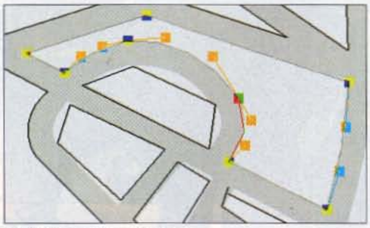
I'd be inclined to group all the outlines and lock them in place so that when you start overlaying text and other drawings you don't interfere with the outline map – the Lock option is near the bottom of the Select menu.

The other alternative is to put the text on a newly created Layer 3 and switch off Sel on Layers 1 and 2 but keep them visible.

The map outline needs text to show roads and other identifiable features. This can be typed into DrawPlus in a sans serif typeface such as Homerton or Swiss for clarity with fancy fonts for headings. This will often need to be rotated so you'll have to use the Change to path option from the Special menu. Use the rotate option or the rotate ear on the text object and position it along, or at the side of, the road. You'll probably have to scale it down to fit. Use the Scale option to reduce it by a fixed amount instead of the adjust ear or you might distort it, unless of course that's the effect you want.



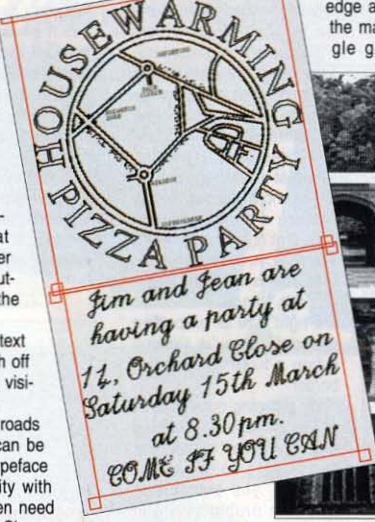
Change text to graphics objects before rotation



Editing the road can be tricky

I decided to make the map more special by adding a title round the edge using FontFX from DataStore. Simply select a typeface that looks suitable, type in the required text, set the line thicknesses, colours and fill of the text and select the display options.

The resulting drawing was loaded into the map, moved into position, reduced to fit round the edge and grouped with the map to form a single graphics object.



HOUSEWARMING PIZZA PARTY

Jim and Jean are
having a party at
11, Orchard Close on
Saturday 15th March
at 8.30pm.
COME IF YOU CAN

The finished invitation

This makes manipulation easier when adding text to the invitation and for balancing the text and graphic elements for a better visual effect.

The text was added line by line and selected in a group for automatic centring using the Align option from the Arrange menu. Spacing text vertically in equal amounts can be made easier by selecting all the text to see the gaps between the lines and then adjusting each line to make them equal.

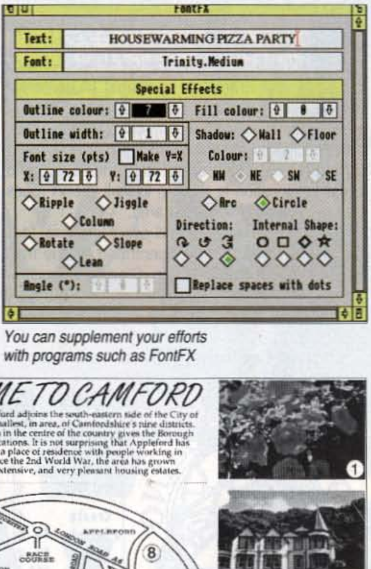
An easier alternative is to use Edit for blocks of text which centres and spaces text exactly as specified. The same technique can be used to align blocks of graphics and text.

To produce two A5 invitations, drawings or maps on an A4 printout, reduce them by 66 per cent and put them side by side on a landscape A4 page.

It's easier to change the paper orientation to landscape than to rotate the drawings through 90 degrees which won't be possible unless absolutely all your text has been converted to graphics. Normal text can't be rotated – or at least not in DrawPlus.

I hope you'll experiment with map design for your own purposes. If you don't find the prospect exciting or at least useful I hope you'll find some of the techniques covered in this article useful in their application to other areas of computer-based graphic design.

● *Next month, in the last of the series, we move from maps to architecture.*



Text: HOUSEWARMING PIZZA PARTY

Font: Trinity.Medium

Outline colour: 7

Fill colour: 0

Outline width: 1

Font size (pts) ☐ Make Y=X

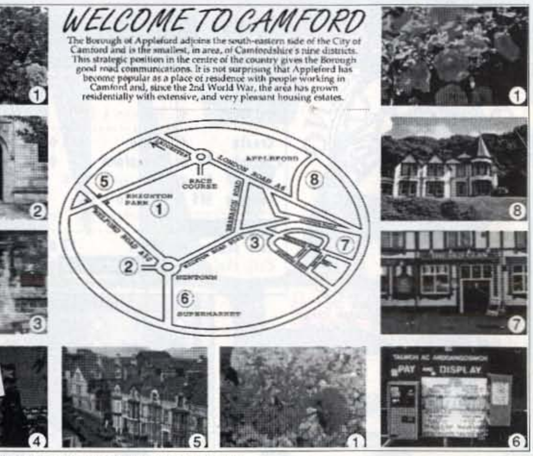
Colour: 2

X: 72 Y: 72

Angle (°): 0

☐ Replace spaces with dots

You can supplement your efforts with programs such as FontFX



WELCOME TO CAMFORD

The Borough of Appleford adjoins the south-eastern side of the City of Camford and is the smallest, in area, of Camfordshire's nine districts. This strategic position in the centre of the country gives the Borough good road communications. It is not surprising that Appleford has become popular as a place of residence with people working in Camford and, since the 2nd World War, the area has grown residentially with extensive, and very pleasant housing estates.

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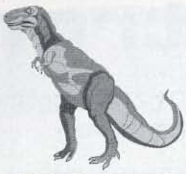

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+VAT
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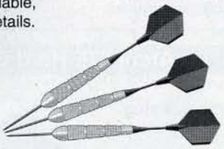

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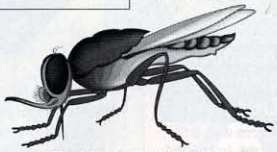

TopicArt5 - Bugs to Slugs

SCSI Floptical Disk Drives

Yes its true!, each 3.5" floptical diskette can hold 20Mb of programs and data etc. Floptical disc drives which are SCSI devices are a wonderful complement to existing SCSI hard disc users or as an alternative to a hard disc solution.

floptical
Diskette

= 20Mb

Transfer rates are typically 65ms/100k/sec and like standard floppies are competely transportable. Flopticals are also a good media for backing up hard discs. All units are externally housed in an attractive case with power supply and includes one floptical floppy.

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Tiler £10+VAT

A printing utility which allows you to print Draw or Sprite files at any size using any printer. The user simply loads the required draw or sprite file into Tiler specifying the size of poster required, using a preset paper size, ie. A2, A0 etc, or as a percentage of the original size or in physical dimensions, ie millimetres. The document will then be increased or decreased in size automatically and printed over several pages with crop marks provided on each page to assist cutting/overlapping.

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QuickS(ou)nd allows you to load, play, convert & resave existing samples. Armadeus, Tracker, raw data and Sound Synth samples are supported. Samples can also be converted into modules for use with the sound system, Maestro, Rhapsody etc or converted into stand alone Utility sample modules which when called, via a star command, loads the utility, plays the sample and then removes itself completely from memory (this feature is not available on any other sound package). Special effects which can be applied to samples include Reverse, Echo, Max Vol, alter replay rate and resample at other frequencies.

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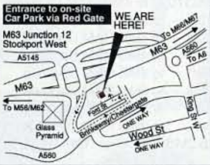

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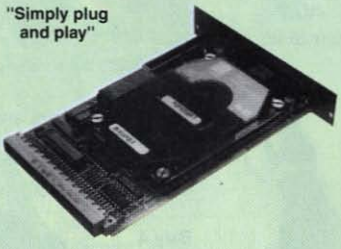
• **R300**-4 Layer RAM upgrade board (Bare).	**£25**
• **R302**-A3000 – to 2MB RAM Upgrade	**£36**
• **R303**-A3000 – to 2MB RAM Upgrade (expandable to 4MB)	**£55**
• **R304**-A3000 – to 4MB RAM Upgrade	**£125**
• **R311**-A305 – to 1MB RAM Upgrade	**£30**
• **R312**-A305/310 – to 2MB RAM Upgrade	**£149**
• **R314**-A305/310 – to 4MB RAM Upgrade	**£205**
• **R412**-A410/1 – to 2MB RAM Upgrade	**£30**
• **R413**-A420/1 – to 4MB RAM Upgrade	**£60**
• **R414**-A410/1 – to 4MB RAM Upgrade	**£90**
• **R810**-A410/1 – to 8MB RAM Upgrade	**£579**
• **R820**-A420/1 – to 8MB RAM Upgrade	**£549**
• **R840**-A440/1 – to 8MB RAM Upgrade	**£479**
• **R814**-R140 – to 8MB RAM Upgrade	**£499**
• **A5000** – to 2MB additional RAM Upgrade	**£92**

0% Finance & Special Teachers/Academics' prices Now available on A3000L/C and A5000 L/C Micro Systems

Archi IDE Hard Cards



"Simply plug and play"

Watford's NEW low cost, high performance revolutionary IDE Hard Cards for the A300 and A400 series Archimedes are unbelievably easy to install – you simply slot one into any vacant podule backplane slot in the rear of your computer. These stunningly engineered, light weight but fast, 2.5" miniature hard drives are mounted onto the professionally designed cards, and are supplied with the fully Acorn-conformant IDE Filing System ready installed and ready to run. A novel feature of the hard cards is that they can be easily removed and transported to another Archimedes, for example to make a hard disc backup, or to transfer saved files from work to home etc. Security of files on the hard disc is ensured by our unique security password lock, which allows files to be read only, but not overwritten or deleted – ideal for use in school applications where the integrity of your master software needs to be retained.

ADA 0650	21Mb	23mS	**£199**
ADA 0800	30Mb	19mS	**£295**
ADA 0660	44Mb	28mS	**£359**
ADA 0810	60Mb	18mS	**£409**
ADA 0670	89Mb	18mS	**£629**

(Can be used as a Removable Hard Drive)

NEW

Archimedes A300/A400 SCSI Hard Disc Offer

(while stocks last)

100MB Hard Disc Upgrade complete with Controller card, Cables, Formatter and Manuals

RRP: £999

Offer Price: £339

Syquest Removable Disc Units

These Hard Drive units are supplied complete with a cartridge 42Mb removable, cables and a high flow fan for cooling.

• Syquest Drive Unit pack	**£399**
• As above + SCSI Card	**£535**
• Spare 42Mb Disc	**£55**

Hi-Speed, Low Cost Archi Hard Disc Drive

Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine. An optional 20Mb or 40Mb hard disc can be supplied on the podule expansion card itself, with its fast transfer rate and power saving modes the drive is ideal for storing commonly used software such as the !Fonts application.

A powerful security feature has been provided with the two unique commands *IDELock and *IDEUnlock, ideal for educational establishments where hacking or tempering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The !IDEForm Write Protect option is particularly useful in conjunction with *IDELock as it will prevent any unauthorised deletion of data.

By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

Hardware

- Single width EuroCard
- Supports proposed ANSI ATA (IDE) specification
- Fast 16 bit MEMC interface interrupt driven to support background disc operations
- 5 Mbytes per second peak transfer rate
- Built in Non Volatile RAM to hold configuration
- LED activity indicator
- 37 way D type socket for external drives
- Optional on-card 20Mb or 40Mb hard disc
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

Software

- Conforms fully to the Acorn IDE Specification
- All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon
- !IDEForm, WIMP based configuration and formatting software
- Drives can be individually write protected
- Up to four drives over multiple cards
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead
- !IDEFSDisk, creates PC emulator hard discs

Prices

Part No.	Capacity	Access Speed	Price
ADA 0520	44Mb	28mS	£215
ADA 0530	100Mb	16mS	£295
ADA 0570	200Mb	15mS	£479
ADA 0580	330Mb	15mS	£849

All the above 3.5" hard drives are supplied complete with Controller Card, cable & Software on ROM. (Internal fitting). For use with A300/A400/A500 series machines.

For A3000 users an additional external Case and PSU will be required.

AAA 0300 External Case & PSU for A3000 **£85**

Internal Hard Disc Drives for A3000

State of the art, 4 layer internal IDE Hard Cards for the A3000. Software supplied in, On-board ROM.

ADA 0700	21Mb	23mS	£185
ADA 0770	30Mb	19mS	£285
ADA 0720	44Mb	19mS	£349
ADA 0750	60MB	18MS	£399
ADA 0730	89Mb	18mS	£619

Supplied ready assembled. No soldering required. Simply plug into the alloted space.

A3000 users will require External Case and Power Supply £85

or A3000 Ultimum Expansion System **£149**

Lease Purchase facility now available. Please telephone or write in for details.

Silicon Vision

Data Vision	£110	Solids Render	£120
Graphic Development	£40	Share Holder	£135
Realtime Graphics	£75	Super Dump	£22
RISC BASIC	£119	3D Graphic Development	£40
RISC FORTH	£119		

Desk Top Publishers

Acorn's Archi DTP Package	£99
• Equasor £39; • Expression-PS	£19
Impression 2 DTP Pack	£125
Impression Junior	£69
Impression Business Supplement	£39
Impression II Borders Disc	£19
Tempest DTP Package	£90

Archi Wordprocessors

Pendown Archi	£48	1st Word Plus – 2	£63
Pendown Outline Fonts	£18	Archie Spell Master	£25
Wordwise + Disc	£24	PD Spellchecker	£40
Image Writer	£25	Graphic Writer	£19
Interword Disc	£24	EasiWord	£18

Databases

AlphaBase	£36	Magpie	£40
Flexifile	£79	Multistore v2.01	£176
Knowledge Organiser	£42	Pinpoint	£65

Spreadsheets

Intersheet Disc	£24	Schema	£89
Viewsheet	£45		

Business Graphics

GammaPlot	£39	Sigmaplot	£39
Interchart Disc	£17		

Integrated Packages

• Pipedream 4	£149
• Desktop Office – Database, Graphs & Charts, Wordprocessor Spreadsheet, Communications	£98
• Desktop Folio – Wordprocessor, Desktop & Interactive Publishing. Ideal for school	£75

A3000 I/O Card (User, Analogue & IIC)

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analog to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

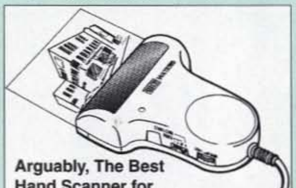
The card is provided with an extensive manual explaining installation, all software commands, connector pin outs, hardware addresses and example programs.

Features

- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
- A 10 bit Analog to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices. **£42**

More Archimedes Products See Pages 3, 5, 6, 8, 10, 13

NEW 256 Grey-Scale Scanner



Arguably, The Best Hand Scanner for the Archimedes

Watford proudly introduces its new innovative 256 grey-level hand scanner for the Archimedes range of micro computers. It offers up to 256 grey levels at a maximum of 400 dpi, and comes complete with the most advanced and sophisticated 256 grey scale scanner software currently available for the Archimedes.

Designed by our own R & D team, it offers the best overall scanning solution for incorporating pre-drawn logos, artwork, photographs and sketches into desktop publishing documents and other graphics programs, including !Paint etc.

The scanner has been openly welcomed by the computer press.

"The image quality which this little beauty can produce is quite stunning" – Archimedes World – July 1992.

"Other Arch image grabbers have been irritating or just plain useless".

"Loads of well written, easy-to-follow and in-depth help, all glued together in a very handsomely designed manual." – Computer Shopper – July 1992.

The major features of the package are:

Multiple copies of the image in memory at once, allows multiple consecutive operations without having to save the original image to disk.

Instant redraw of all 4 image buffers. No re-calculations needed unlike other packages that use on the fly screen-dithering.

High advanced dithering and image size reduction available via industry standard ChangeFSI package for maximum image quality. An invaluable aid to reduce the size of the image whilst maintaining image quality.

A unique LED indicator on the scanner shows you when the scanner is being moved at close to the maximum scanning speed, not just when it is too late and a scan line has been missed by moving the scanner too fast.

Fully adjustable scale and size of image preview when scanning. Image preview window can even be behind other windows and preview is shown in real-time with maximum number of grey-scales available.

Support for Serial Port Graphics Enhancer. Allows up to 256 simultaneous grey scales on screen at once.

True brightness, contrast and gamma correction. All can be specified by a value to exactly match monitor/printer. No guessing with shapes of curves.

RISC OS 3 features include rotation and shearing. Scans normally are scanned at a slant rather than being rotated, shearing enables the scan to be corrected better than rotation.

Scanner scans at an amazing 3ms per line. A post card at 400 dpi takes only 7.3 seconds to scan, creating over 3Mb of data.

Selectable 256 grey-scale, 256 grey-scale half width, 16 grey-scale and monochrome scanning modes. Half width mode enables longer 256 grey-scale scans to be achieved.

Fast RISC OS printing with multiple options.

Save image in AIM, TIFF or RISC OS Sprite format.

Advanced in-built image processing options.

Convolution digital filtering fully implemented with over 100 filters covering edge detection, image enhancement and image smoothing.

Single width, high quality podule using surface mount technology.

Just compare the competition on our price and above features. There can only be one choice.

Continued→ → → → → → → → →

ULTIMUM – Archimedes A3000 Podule Racking System

THE ONLY LOGICAL WAY TO EXPAND YOUR A3000 COMPUTER

Price: £149

Minerva's Archimedes Software

EasyWord	£18	Mailshot*	£27
Home Accounts	£35	Reporter*	£27
Time Tabler	£549	School Admin*	£65
System Delta	£59		

System Delta Program Reference Manual	£29

** Requires System Delta to operate*

Stand alone Business Accounts Packages
Sales; Purchase; Order Processing and Invoicing; Nominal; Stock management

£79 per module

or Complete Business Package **£325**

ARM 3 Turbo Card MkII

Simply The Best

Here it is at last – the all new Mark 2 version of Watford's highly acclaimed ARM 3 processor board for the Archimedes and now also the A3000 series computers. Using the latest surface mount technology on a high quality four layer circuit board we have reduced the overall size to a mere 53mm x 45mm, and the cost to only £169. Mk II upgrade will increase the speed of your micro by a factor of 3 to 6.

Any competent A300 or A400/1 series micro owner can fit the upgrade himself, as we provide full fitting instructions and a special ARM chip extraction tool. However for A3000 micros and those not wishing to perform the upgrade themselves, we will collect, upgrade and return your micro by courier service, at an additional cost of £18.

(A300 and old A440 series owners please note – you will need to upgrade to MEMC1A for ARM3 to work.)

RRP £249

Offer Price £169

Acorn have satisfactorily evaluated Watford's ARM 3 upgrade and the A3000 upgrades are fitted by Acorn approved surface mount technology centre, therefore its fitment will not invalidate Acorn's warranty on the micro.

Concept Keyboards

Standard A3 Keyboard with BBC Software	£138
Standard A4 Keyboard with BBC Software	£109
Archi A3 Keyboard	£139
Archi A4 Keyboard	£110

Archi Mouse Port Splitter

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes. £15

Archimedes to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.

New RISC OS Version also available (please specify)

For A3000	£15
For A5000	£16

For A3000 Serial Upgrade **(£19)** required

BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheet, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below) **£399**

FREE OFFER

FREE with every BBC Master purchased from us during July

A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables and a Utilities disc incl. 2 games, plus

Gemini's OFFICE MATE & OFFICE MASTER

Add-Ons & Accessories

Econet Module for the Master		£42
Twin ROM Cartridge for Master		£9
Quad ROM Cartridge for Master		£14
Master Reference Manual I	(No VAT)	£14
Master Reference Manual II	(No VAT)	£14
Master Advance Ref Manual	(No VAT)	£17
64K Upgrade Kit for B+		£32
Acorn 1772 DFS Kit complete		£49
ECONET Upgrade Kit for BBC B		£42
ALL ECONET UPGRADES Available		
ARIES' IEEE Interface for BBC B & Master		£238
Morley Teletext Adaptor with ATS Rom		£99
Ecolink		£270

Z88 Portable Micro

£179

Z88 ACCESSORIES

• 32K RAM Pack or 32K EPROM Pack	£16
• 128K RAM Pack or 128K EPROM Pack	£32
• 512K RAM Pack	£86
• 256K Eprom Pack	£55
• Z88 Eprom Eraser Unit	£38
• Z88 Carrying Case	£8
• AA Nicad Rechargeable Battery	£1.50
• Battery Charger Compact & Fast	£6
• Z88 Serial Printer Cable	£8
• Z88 Parallel Printer Cable	£18
• Z88 to Archi Link	£15
• Z88 to BBC Link	£8
• Z BASE	£56
• Z88 to PC Link II	£27
• Z88 to Macintosh	£32
• Z88 Mains Adaptor	£9
• Z88 Modem	£114

Archi Real-Time Digitiser

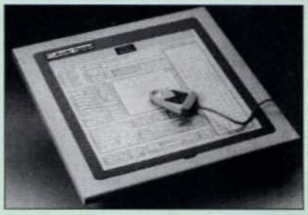
Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £119

A Set of Colour Filters for colour image grabbing using a video camera	£16

Archi Graphic Tablet



The Archi Graphic Tablet offers performance and accuracy comparable to other tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely. The package is supplied complete with sophisticated Archi software. (Now, fully LinCAD compatible. Recommended by Linear Graphic for use in Education).

(FREE this month, PC Mouse Drivers & Art package)

Special Price £199

(Price includes Tablet, Leads, Software & Puck)
Stylus Optional Extra **£20**

Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus **£125**

Disc Plonker Rack

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: **£2**

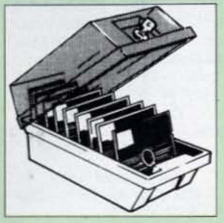
Special Bulk Offer Discs

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

Type	S/S 40T	D/S 40T	D/S 80T
• Without Sleeves 5.25"	£28	£33	£38
• With Sleeves 5.25"	£31	£36	£41
• 3.5" D/S D/D	£27 for 50	£49 for 100	

Antistatic Lockable Disc Storage Units



Gives double protection – Strong plastic case that affords real protection to your discs.
Antistatic helps avoid data corruption whilst in storage. The smoked top locks down.
Dividers and adhesive title strips are supplied for efficient filing of discs.

• **M35** – holds up to 50 5.25" discs	£4.95
• **M85** – holds up to 95 5.25" discs	£6.95
• **M25*** – holds up to 25 3.5" discs	£4.95
• **M50** – holds 50 3.5" discs	£6.50
• **M100** – holds 100 3.5" discs	£6.99
• **M10** – holds 8 of No. 10 Data Cartridges	£15

* Not lockable

Dust Covers (For our Disc Drives)

Single CLS (without PSU)	£3.20
Single CS (with PSU)	£3.25
Twin CLD (without PSU)	£3.85
Twin CD (with PSU)	£3.90

3M – Diskettes

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electonics your 3M Appointed Distributor.

• *10 x 5.25" S/S D/D 40T (744)*	*£5*
• *10 x 5.25" D/S D/D 40T (745)*	*£5*
• *10 x 5.25" S/S D/D 80 Track (746)*	*£7*
• *10 x 5.25" D/S D/D 80 Track (747)*	*£7*
• *10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT*	*£9*
• *10 x 3.5" S/S D/D 40/80 Track*	*£7*
• *10 x 3.5" D/S D/D 40/80 Track*	*£7*
• *10 x 3.5" Double Sided High Density*	*£13*

Top Quality 3.5" & 5.25" Diskettes

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

• *10 x **M3** 3.5" D/S D/D 80 Track*	*£7*
• *10 x **M9** 3.5" D/S High Density*	*£12*
• *10 x **M4** 5.25" S/S D/D 40 Track*	*£5*
• *10 x **M5** 5.25" D/S D/D 40 Track*	*£5*
• *10 x **M7** 5.25" D/S D/D 80 Track*	*£7*
• *10 x **M8** 5.25" D/S H/D Hi-Density*	*£9*
• ***M2** 3" Double Sided*	***£2.50** each*

CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 250234 or 233383

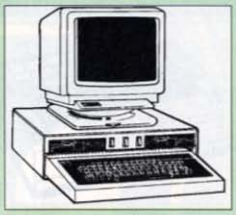
3.5" Disc Drive

These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	Description	
	Disc Drive without PSU	
• **CLS35:**	Single Disc Drive, 400K	£59
• **CLD35:**	Twin Disc Drives, 800K	£109
	Disc Drive with PSU	
• **CS35:**	Single Disc Drive, 400K	£82
• **CD35:**	Twin Disc Drives, 800K	£126

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

Disc Drives in Monitor Stand



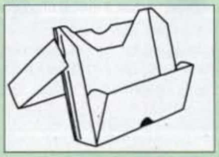
• **CDPM 800S** – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

£165

• **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5".

£154

Plastic Library Cases



DLC1 – Holds 5 x 3.5" Discs.	£1.50
DLC2 – Holds 10 x 3.5" Discs.	£1.90
DLC3 – Holds 5 x 5.25" Discs.	£1.60
DLC4 – Holds 10 x 5.25" Discs.	£2.00

Disc Albums

Attractively finished in leather-look PVC Vinyl

DW1 – Holds 6 x 3.5" Discs	£2.50
DW2 – Holds 6 x 5.25" Discs	£3.00
DW3 – Holds 20 x 5.25" Discs	£3.50
DW4 – Holds 40 x 3.5" Discs or 5.25" Discs	£4.50

Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

Acorn & Watford DFSs

• Watford sophisticated DFS ROM	£16.00
• Watford DFS Kit complete	£69.00
• We will exchange your existing ROM for Watford's ultimate DFS ROM at only	£12.00
• DFS Manual (comprehensive)	£6.95
• Acorn DNFS ROM	£17.00
• Acorn ADFS ROM only	£25.00
• Acorn 1772 DFS ROM Kit	£49.00

Watford's MkII 1772

Single/Double Density DFS

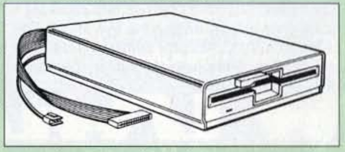
Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1772 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1772 DFS, plus many more added features.

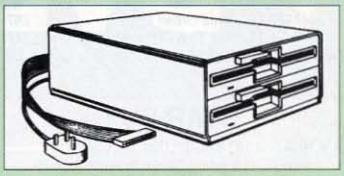
• Complete Kit	Special Price **£44**
• DDFS Manual	(No VAT) **£6.95**
• We will exchange your existing DFS Kit for our sophisticated DDFS for only	**£26**

Quality Disc Drives from Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable. For ease of use, the switches are front mounted. Follow the trend with a Watford plinth. (Turn to the 6th page of our advert for the Plinths).
P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us.

"Test Bureau Approved for Use in Education"





Our Disc Drives conform to BS415

Type	Description	
	Disc Drive without PSU	
• **CLS400S:**	Single, 40/80 track 400K Double sided Drive	**£70**
• **CLD800S:**	Twin, 40/80 track, 800K Double sided Drives	**£138**
	Disc Drive with PSU	
• **CS400S:**	Single, 40/80 track, 400K Double sided Drive	**£80**
• **CD800S:**	Twin, 40/80 track, 800K Double sided Drives	**£149**

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

Continued→ → → → → → → → →

FREE
Connecting lead with every monitor purchased from us. Please specify type required.

Microvitec Monitors

• **1431** – Standard Resolution Monitor	£169
• **1451** – Medium Resolution Monitor	£209
• **Cub3000** Medium Res for A3000	£189
• Dust Cover for Microvitecs	£5.50
• **Touchtec 501 Touch Screen**	£239

Now 3 years Parts & Labour warranty on all Microvitec Monitors

Multiscan Colour

• Eizo 9060S	£389	• NEC 6FG	£1525
• Eizo F550i	£719	• Taxan 770LR	£362
• Eizo T560i	£995	• Taxan 775	£362
• NEC 3FG	£370	• Taxan 795	£397
• NEC 4FG	£465	• Taxan 875	£685
• NEC 5FG	£850	• VIDC Enhancer	£25

Aries AlphaScan Monitor

Pound for Pound, the AlphaScan VGA Multiscan monitor provides the maximum performance and greatest flexlbility of any 14" colour monitor for the Archimedes micro.

Its multiscan circuitry provides automatic adjustment for frequencies between 30 and 60KHz horizontal, and 50 and 90Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The Multivideo VIDC Adaptor supplied (free) with the monitor allows high resolution operation in all screen modes. **£325**

Philips Monitors

• **BM7502** 12" Hi-res Green Monitor	£67
• **CM8833** 14" Med. Res Colour Monitor	£172
• Dust Cover for Philips Monitors	£6

STAR BUY

- **PHILIPS 14"** Medium Res, dark glass, attractively finished Colour Monitor. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require). **ONLY £169**

Spare Monitor Leads

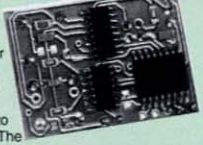
BNC Lead for Zenith or Philips	£3
Skart Monitor Lead	£5
RGB lead for TAXAN Monitors	£3
Archimedes Colour Monitor Lead	£7.50

Aries 2000 Colour Monitor

This attractively finished, etched screen medium res monitor is supplied complete with built-in speaker, volume control and video output. All controls are located on the front panel for ease of use. Ideal for BBC, BBC Master, Archimedes and Amiga.

A bargain at £159

VIDC Enhancer

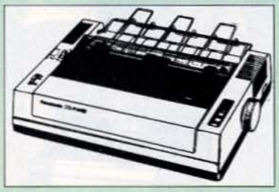


This unique VIDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to suit all requirements. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A WIMP application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

Super VGA VIDC Card: Its unique design allows the horizontal and vertical sync to be buffered and have the polarity changed under software control **£45**

MultiVideo VIDC Card: As above but for MultiScan monitors only. **£25**

Panasonic Printers



• KX-P1123	£129	• KX-P1695	£270
• KX-P1124i	£173	• KX-P2624	*£275
• KX-P1170	£100	• KX-P2180C	£160
• KX-P1624	£270	• KX-P2123C	£200
• KX-P1654	*£334		

*** Price includes 12 months On-site warranty**

Cut Sheet Feeders

P36 – 1124/24i	£79	**P37** – 1123/70/80	£69
P38 – P1624/95; P2624			£129

Buffers

P12 4K Buffer Board for KX-P1081	£55
P14 32K Buffer P1123/24/70/80 P1540/92/95; P1624/54/95	£16

Serial Interfaces

P19 for P1123/24/24i/70/80/1624/54/95/2624	£49

Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110 for KX-P1081, 1592 & 1595			£6
P115 for KX-P1180	£7	**P145** for KX-P1124	£7
P140 for KX-P1540	£8	**P155** for KX-P1624	£8

Colour Ribbons for KX-P1081, 1592 & 1595
Brown, Blue or Red **£9 each**
P150C Colour for P2123/2180 **£15**

Citizen Printers

• 120D Plus	£95	• Swift 24E#	£225
• 224	£185	• Swift 24X	£299
• PN-48	£199	• 24X Colour Opt	£32
• Swift 9	£145	• PN48 Ribbon	£4

# FREE Colour Option with Swift 24E
+ FREE 2 years Parts and Labour warranty on all Citizen Printers

• Swift 9 Colour Option		£19
• Swift 24 Colour Option		£29
• Swift 24 Ribbons	Black **£4**	Colour **£13**
• Swift 24X Ribbons	Black **£8**	Colour **£16**
• Citizen/Archimedes Colour Printer Driver		£15

Integrex Ink Jet Printers

• Colour Jet 132 Printer	£449
• Paper Roll	£6.50
• BBC Screen Dump Software	£10
• Colour Cartridge	£21
• Black Cartridge	£12.40
• 100 A4 OHP transparencies	£55
• 8K Serial Interface Optional	£123
• Colour Jet 2000	£POA
• Betajet Ink Jet Printer	£275

Star Printers

• LC15	£178	• SJ48 Inkjet	£174
• LC20	£105	• XB24-200 Colour	£295
• LC24-15	£245	• XB24-250 Colour	£355
• LC24-20	£158	• XB24 Colour kit	£29
• LC24-200	£170	• ZA200 Colour	£244
• LC24-200 Colour	£305	• ZA250	£310
• LC200 Colour	£143		
• Star/Archimedes Colour Printer Driver			£15

Cut Sheet Feeder

LC10/200/24-10	£65	LC15/LC24-15	£125
XB24-10	£80	XB24-15	£139

Serial Interfaces

8K Ser LC-200; LC24-200; FR10; FR15; XB24-10; XB24-15	£52

Buffers

32K Ram Card for LC/XB24-10; 15; LC200	£55

Ribbons

LC10; LC10-II; LC15	Black **£4;**	Colour **£6**
LC-200; LC24-200	Black **£5;**	Colour **£12**
XB24-10; XB24-15	Black **£5;**	Colour **£12**

Laser Printers

All Laser Printers include 12 months On-site maintenance

Brother HL-4	4ppm	£575
Brother HL4-V	4ppm	£675
Brother HL4-PS Postscript	4ppm	£1045
Brother HL8-V	8ppm	£995
Canon LBP4 LITE	4ppm	£529
Canon LBP4+ 1.5M RAM	4ppm	£685
Canon LBP-8 III	8ppm	£970
Canon LBP-8III Plus	8ppm	£965
Epson EPL4300	4ppm	£635
Epson EPL4100	6ppm	£539
Epson EPL7500	6ppm	£1145
Epson EPL8100	10ppm	£965
HP Laserjet IIP+	4ppm	£549
HP Laserjet III	8ppm	£1015
HP Laserjet IIID	8ppm	£1495
HP Laserjet IIIP	4ppm	£699
HP Laserjet IIIsi	16ppm	£2519
NEC Silentwriter S62P P/script	6ppm	£1089
NEC Silentwriter 266	8ppm	£675
NEC Silentwriter 290P P/script	8ppm	£1389
Panasonic KX-P4420	8ppm*	£620
Panasonic KX-P4450i*	11ppm*	£915
Panasonic KX-P4451		£1240
Panasonic KX-4455 Postscript	11ppm*	£1450
Panasonic KX-P4430 Satin Print*	5ppm*	£645
Star LP-8 III 2	8ppm	£1249
Star LP-8 III	8ppm	£910
Star LP-8 Star(post)script	8ppm	£1140
Star LP-4	4ppm	£565
Star LP-4 Mk 3	4ppm	£649
Star LP-4PS Postscript	4ppm	£779

* Now with 2 years On-site warranty

Laser Toners

Canon 2, 3 & 4	£46	Star LP4/LP8	£69
Epson GQ	£13	KX-P4420/50	£19
EPL 4100	£59	Laserjet HP IIP & IIIP	£42
EPL7100/7500/ 8100	£125	Laserjet II/D, III/D	£48
		Qume Crystal (3)	£58

Laser RAM Upgrades

IIP; III/P 1Mb	£51	EPL7100 256K	£39
IIP; III/P 2Mb	£88	GQ5000 512K	£42
IIP; III/P 4Mb	£135	KX4420/50 1M	£75
II & IID 1Mb	£64	KX4420/50 2M	£115
II & IID 2Mb	£99	KX4420/50 4M	£195
II & IID 4Mb	£146	Star LP8 1M	£139
Canon LBP4 1M	£105	Star LP8 2M	£275
Canon LBP8 2M	£125		

Laser Drum & Developer

• Epson Drum	GQ5000	£93	EPL7100	£129
• Panasonic 4420 Drum		£60	Developer	£59
• Panasonic 4450 Drum		£93	Developer	£80
• Qume Drum		£76	Developer	£56

Jetpage Postscript Cartridge

• HP IIP/III	£225	IID & IIID	£227

Various Add-Ons

• Laserjet Appletalk Interface	£135
• HP Adobe Postscript	£399
• Pacific Page Postscript	£259
• HP Premier Font Collection	£28
• Laserjet various Font cartridges	from £45

Hewlett-Packard Printers

# Desk Jet 500	**£285**	*Paintjet XL 300	**£1920**
Desk Jet 500 Col.	**£429**	*Quiet Jet Plus	**£415**
*Paint Jet Colour	**£525**	*HP Think Jet	**£265**
*Paintjet XL	**£1225**		

# 3 years extended Parts & Labour warranty	**£49**
* Price includes 12 months on-site warranty	
• DeskJet 500 Cart. Black **£15;** Colour	**£27**
• Paintjet Cartridges Black **£19;** Colour	**£23**
• Desk Jet 500 256K RAM cartridge	**£69**
• HP Epson FX Emulation Cartridge for Desk Jet	**£59**
• DJ 500 High Capacity Black Cartridge	**£21**
• DJ 500 Colour Archi Printer Driver	**£15**

Plug In Font Cartridges for DJ 500

• 22706B – Prestige, Elite, Line Draw fonts	**£55**
• 22706C Letter Gothic & HP Line Draw fonts	**£56**
• 22707P – Proprint Emulation Cartridge	**£57**
• Desk Jet Unlimited (Book No VAT)	**£19.75**

Canon Bubblejet Printers

	Printer	CSF	D'ble Bin	Ink Cart
BJ10EX	**£180**	**£43**	–	**£16**
BJ20	**£265**	–	–	–
BJ300*	**£284**	**£88**	**£65**	**£12**
BJ330*	**£380**	**£110**	**£79**	**£12**
BJC800C	**£1411**	–	–	–

* Includes 12 months On-site warranty

• Spare Battery pack for BJ10E	**£33**
• BJ10EX – Archi Turbo Driver	**£42**

Special Offer:

Canon BJ10EX Printer + CC's Turbo Driver **£222**

NEC Pinwriter Printers

• P20	**£180**	• P70	**£419**
• P30	**£240**	• P90	**£635**
• P60	**£325**		

• P60/70 Colour Option Kit	**£59**
• Ribbons Black for P20/30 **£6** for P60/70/90	**£7**
• Ribbons for P60/70/90 Black **£9** Colour	**£13.50**

Cut Sheet Feeders

P20 **£59;** P30 **£85;** P60 **£89;** P70/90 **£80**

Epson Printers

DFX5000	**£1079**	LQ1060 Colour	**£595**
DFX8000	**£1940**	LQ1070	**£313**
FX850	**£264**	LQ1170	**£435**
FX1050	**£336**	LQ2550+	**£675**
LQ100	**£154**	LX400	**£101**
LQ200	**£161**	LX850+	**£140**
LQ450	**£165**	LX1050	**£206**
LQ570	**£201**	SQ850	**£432**
LQ860 Colour	**£443**	SQ1170	**£589**
LQ870	**£359**	SQ2550	**£625**

Cut Sheet Feeders for

LQ570, LQ870 **£47**

LX400/850/LQ200/400/450/500/550
LQ1010/1070/1170 **£72**

LX1050 **£115** FX850/LQ860 **£128**

FX1050/LQ1060/SQ850 **£155**

LQ2550 **£299** SQ2550 **£210**

Tractor Feed for

LQ800 **£44;** LQ850/FX850 **£69;** LQ1050/FX1050 **£85;** LQ2500 **£90;** LQ2550 **£90.**

Accessories

• EX800/1000 Colour Option	**£45**
• EX800/1000 Colour Ribbon	**£14**
• LQ2500 Colour Option	**£65**
• Multifont Card for LQ550/850/1050	**£95**

Epson Printer Interfaces

RS232 **£28** RS232 + 2K Buffer **£52**

Printer Leads

BBC Centronics 4' long	**£5**
BBC Centronics 6' extra long	**£7**
Compact's Special Centronics Lead	**£7**
Nimbus Centronics Lead	**£6**
IBM/Archimedes Parallel Lead 6'	**£5**
IBM/Archimedes Parallel Lead 5 metres	**£10**
IBM/Archimedes Parallel Lead 10 metres	**£15**
Double Ended 36 way Centronics Lead 4'	**£7**
Double Ended 36 way Centronics Lead 6'	**£9**
RS232 Leads (Various)	**P.O.A.**

Fujitsu Printers

B-100	**£205**	DL1100 Col	**£267**
B-200	**£299**	DL1200	**£363**
DL-900	**£181**	DL3600	**£508**
DL1100	**£217**	VM800	**£1036**

Ribbons

DL900/1100/1200	Mono	**£5**	Col.	**£11**
DL3600	Mono	**£6**	Col.	**£12**
B-100/200 Ink Cartridge				**£15**

Plotters

• HP7440AU	**£925**	• HP7475AU	**£–**

Roland Plotters

• DXY1100	**£490**	• DXY1200	**£620**
• DXY1300	**£825**	• DXY2500	**£2345**
• DXY3500	**£2955**	• Sketchmate	**£310**
• Roland plotter Pens, Fibre tip			**£7.50**

Listing Paper (Perforated)

• 1,000 Sheets 9.5" x 11" Fanfold Paper	**£7**
• 2,000 Sheets 9.5" x 11" Fanfold Paper	**£11**
• 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold	**£21**
• 1,000 Sheets 15" x 11" Fanfold Paper	**£9**
• 2,000 Sheets 15" x 11" Fanfold Paper	**£16**
• 1,000 Sheets true A4 Fanfold Paper 70gms	**£11**
• 2,000 Sheets true A4 Fanfold Paper 70gms	**£21**
• Teleprinter Roll (Econo paper)	**£4**

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

Printer Labels

(On continuous fanfold backing sheet)

1,000 off, 90 x 36mm (Single Row)	**£6.00**
1,000 off, 90 x 36mm (Twin Row)	**£6.25**
1,000 off, 90 x 49mm (Twin Row)	**£7.50**
1,000 off, 102 x 36mm (Twin Row)	**£6.75**

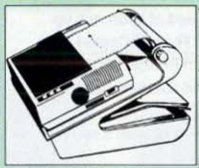
Laser Printer Labels on A4 Sheets

3750 off, 70 x 29mm (3 Rows)	**£15.50**
3000 off, 70 x 37mm (3 Rows)	**£15.25**
2625 off, 70 x 42mm (3 Rows)	**£15.00**

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
BBC Micro	–	£3.50
BBC Master	–	£4.00
Archimedes Micro pair	–	£9.00
Citizen 120D	£2.75	£4.50
DMP2000	£2.75	£4.75
DMP4000	£3.75	£4.85
EX800/1000	£3.50	£5.00
RX/FX80/85/800/MX80	£2.95	–
FX/MX/RX100/1000	£3.95	–
Kaga/Taxan KP810/815	£3.25	£5.00
LQ400/500/550/800/850	£3.25	£6.00
LQ1050/LQ2500	£4.00	–
LX80/86	£2.75	£4.50
LX400/800/850	£3.50	£5.00
M1009/GLP	£2.95	£3.75
NEC P2200	£4.50	£5.00
Panasonic KX1080/81	£6.00	£5.00
Panasonic KX-P1124	£7.00	£5.00
Star LC24-10	£2.95	£6.00
Olivetti Ink Jet Cartridges (set of 4)	£6	

Professional Printer Stand



The professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding.

80 Column version £24 (carr. £3)
132 Column version £29(carr. £4)

Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 printers to 1 Micro with our combined, Sharer/Changer switch boxes.

Standard Low Cost Type

Connects	**Serial**	**Parallel**
• 2 to 1	£10	£11
• 3 to 1	£13	£14
• 4 to 1	£16	£17

Professional Type

Connects	**Serial**	**Parallel**
• 2 to 1	£17	£18
• 3 to 1	£22	£25
• 5 to 1	£34	£38

Cables extra at £6 each

2 Way Compact Printer Switch

A handy 2 way printer switch can be attached to the micro or monitor for ease of use.

• Centronics **£18;** • Serial **£17**

(Cables extra at £6 each)

Auto Printer Sharer Switch

Connects	**Serial**	**Parallel**
2 to 1	£40	£45
4 to 1	£62	£49
8 to 1	–	£89

256k Multi Spooler

These Auto Parallel Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

• 2 In/2 out	**£135**	• 4 In/2 out	**£169**
• 8 In/1 out	**£199**		

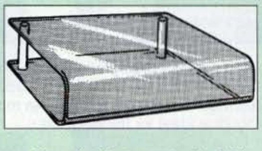
Compact Converter Units

Serial to Parallel **£36** Parallel to Serial **£37**

Laser Direct

• Special High Res Card 600 DPI for Canon LPB 4 & LPB 8 Laser Printers	**£315**
• LPB 4 Printer plus High Res Card	**£875**
• LPB 8III Printer plus High Res Card	**£1275**
• LPB 4 Optional Paper Tray	**£79**

Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version	**£16** (carr £3)
136 Column version	**£20** (carr £4)

Continued→ → → → → → → → →

QUEST MOUSE Mk III

• Quest Mouse III & Quest Paint	£59
• Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont	£89
• Quest Mouse III only	£30
• Quest Paint Software only	£34
• Quest Font Disc (22 Text Fonts)	£15
• Quest Mouse Mat (Red or Blue or Green please specify)	£3
• Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour Printer	£18

(P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

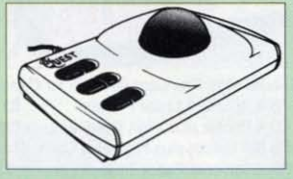
ConQuest

Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

ConQuest ROM Package £30
(Price includes software in ROM and a comprehensive Manual).
(Not Compatible with BBC Compact)

Quest – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version **£25**
QT-20 Archimedes Version **£26**

Mouse Cleaning Kit

To obtain trouble free operation and prolong the life of your mouse, the high tech rodent requires regular cleaning. Our deluxe mouse cleaning kit is ideal for the purpose £3

CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 250234 or 233383

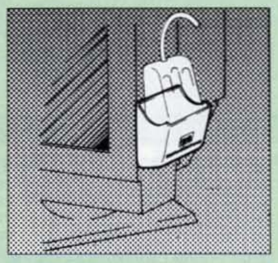
Mk III AMX MOUSE

• AMX Mouse plus Super Art £54

(Please specify for BBC, Master or Compact)

• AMX MOUSE ONLY	£29
• AMX SUPERART Package	£29
• AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse	£25
• PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker	£13
• AMX DESIGN (ROM)	£29
• AMX EXTRA EXTRA	£16
• MOUSE MAT	£3

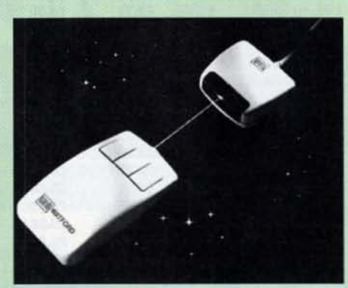
WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive etc.

Only £3

Archi Cordless Mouse



Features
- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power - by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
- Auto Power Shut-Down after 20 seconds inactive

Price £49

BEEB VIDEO DIGITISER

"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro. This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket. The software supplied includes a sophisticated, fast screen dump routine.
Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

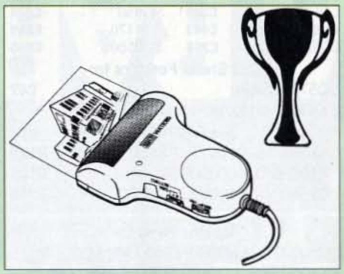
£99

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

Beeb Hand Scanner

Hand-held Scanner for the BBC Micro



Watford Beeb HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs!

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

Beeb HandScan & Firmware £99

WAPPING EDITOR
"MIGHTIER THAN THE QUILL"

Winner of the BBC Acorn User 1990 Award for the Best DTP/Word Processor

The Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

Page Layout Section

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module incorporates the facilities like: pencil, brush, airbrush, polygon, circle, eclipse, fill, cut & paste, etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be – it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

Word-Processor

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

The Font Editor

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individually proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.

Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser.

Wapping Editor Software Pack	**£59**
Wapping Editor plus Mouse	**£79**

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc. Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages layed out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor.

Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.

Supplied complete with instructions. **£12**

Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only). **£13**

Archi A4 Scanner

This most advanced Archi A4 image scanner is supplied complete with ROM based podule software. Features provided include facilities for zooming in on an image and inverting the image in X and Y directions, saving and printing of the sprite created. Interactive help is supplied using the !HELP application on the Acorn applications discs.

The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures.

Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control achieve optimum image clarity.

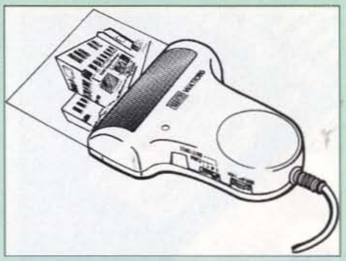
Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.

All these features and facilities combine to make the Archi Page Scanner the fast and convenient way in which to add that extra impact, interest and clarity to documents, reports, instruction sheets, manuals, news letters, etc., from your Archimedes DTP package.

New Low Prices:

Archi A4 Scanner	£269
Sheet Feeder for above	£75
Scanner + Sheet Feeder	£359

Archi Mk II Hand Scanner



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desk top publishing system, for only £119. The package includes the most comprehensive utility software available for the Archimedes, a high quality hand held scanner, and all necessary documentation to get you going straight away.

SCANNER

The scanner is capable of scanning up to an amazing 400 dots per inch (DPI)! The scanning area is 4" wide, and the height is only limited by the maximum amount of memory available. The dot resolution may be switched to 100, 200, 300 or the maximum 400 dpi. One of four operating modes may be selected offering either pure monochrome scanning, or one of three grey level modes. The grey level modes use different size dither patterns to represent up to 16 shades of grey. There is also a dial to allow the "brightness" to be adjusted over a wide range, in order to optimise the quality for any specific image. The scanner interface is a standard, single width, expansion card (podule) which plugs into the Archimedes' backplane. The socket on the rear panel connects the scanner by 1.8 metres of cable.

SCANNER SOFTWARE

Full use is made of the windowing and the multi-tasking facilities of RiscOS. The software is supplied in a 64Kbyte ROM located on the interface board. The scanner appears as a small icon on the desktop icon bar, and the software is retrieved from the ROM simply by clicking on that icon. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. The other facilities included in the software are.

Cropping and scaling to any size including stretching and squashing in X and Y direction separately.

Colour tinting.
X and Y flip.

Edge detection which turns solid objects into outlines.

Selective directional copying which allows features (i.e. lines or text) to be made thicker or thinner.

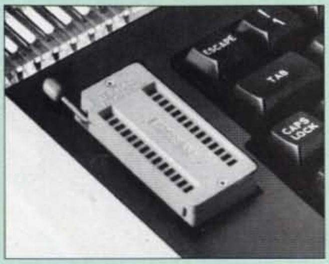
Scanned images may be saved as sprite files or transferred directly into other RiscOS applications (DTP, Draw, Paint) simply by dragging the sprite file into the application's window. Sprites may also be generated using anti-aliasing. This greatly improves picture quality and is particularly effective when scanning material with a range of grey tones, such as photographs. Images can be printed on any printer that is supported by a RiscOS printer driver, with optional settings for portrait or landscape modes, image scale and positioning. Images are printed using the full resolution of the printer and are not limited to the screen resolution.

On-screen help is provided via the RiscOS interactive help facility. Calls are also provided in the ROM for users wishing to write their own software, incorporating the use of the scanner.

AHS-4 Archi 300/400 Version	**£119**
AHS-3 Archi A3000 Version	**£129**

Continued→ → → → → → → → →

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without having to open the lid. The ZIF socket is located into the ROM Cartridge's position. It is very simple to install. No soldering required. Also included in the price is a plastic see through storage case with antistatic lining, which allows you to store 12 ROMs.

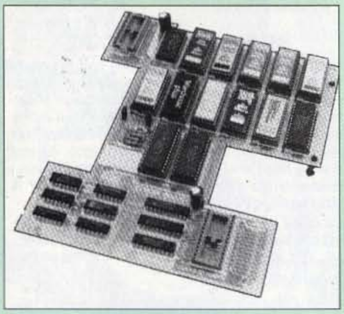
£18

ROM Cartridges for the BBC Master

Will accepts the larger Piggy Back ROMs like Interword, Quest, etc.

Twin **£8**; Quad **£13**

Solderless Sideways ROM Socket Board



- Increases your BBC Micro's ROM capacity from 4 to 16.
- **No soldering required.**
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish") allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £35

Battery Backup fitted **£39**

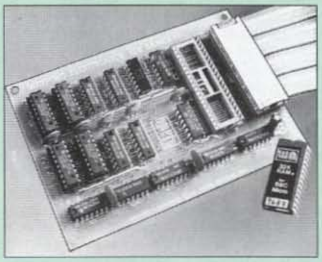
Battery Backup only **£3**

16K Sideways RAM **£8**

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

32K Shadow RAM/Printer Buffer Card Expansion Board



A MUST FOR WORD PROCESSING

Simply plug the ribbon cable plug into the 6502 socket and gain a massive 32K of extra RAM.

- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28K bytes free – 5 times as much as normal.
- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.
- Use the full 32k or the bottom 12K of the expansion RAM as a printer Buffer. (P.S. Only 12K printer buffer can be used with Wordwise & WW+, due to the way they are written).
- Unique facility to turn ROMs off and on again.

Only £54

(Price includes a comprehensive manual and the ROM)

- **ARIES B-32 Shadow RAM Card £55**

Commander Joystick

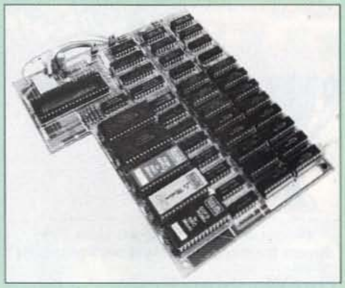
Watford Electronics' new Commander Joystick for the BBC B and Master 128K has a unique dual mode of operation giving selective free floating or self centring fully variable control in both X and Y axis directions. Commander is particularly good for flight simulation and drawing programs.

Features:

- Direct connection to BBC Analogue input port – no interface needed.
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation.
- Trim adjusters for both X and Y axes for fine centre adjustment.
- Convenient stick mounted fire button with additional base buttons.

Price: £15

ROM/RAM Card



- NO SOLDERING required to fit the board.
- Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM.
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- FREE utilities disc packed with software.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

PRICES:

• ROM/RAM card with 32k DRAM	£42
• ROM/RAM card with 64k DRAM	£54
• ROM/RAM card with a massive 128k DRAM	£89

OPTIONAL EXTRAS:

• 16k plug-in Static RAM kit	£8
• 16k DRAM for Upgrade	£13
• Battery backup	£3
• Read and Write protect switches	£2 each
Complete ROM-RAM card with all options fitted	£109

Voltmace Joysticks

Delta 3B Single Joystick	£10
Delta 3B Twin Joysticks	£15
Delta 3C Joystick for Compact	£10
Delta 14B Single Joystick	£11
Delta 14B/1 Adaptor Module	£12
Transfer Software Disc-Tape	£7
Delta-Cat A mouse eliminator Joystick for the Archimedes	£24

Delta Base B

Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128

£25

BBC Educational Software

- Maths with a Story 1 (Disc). 4 primary level maths programs £20.00
- Maths with a Story 2 (Disc). 4 further maths programs. £20.00
- Picture Craft (Disc) 6-14 age group. Pack consists of flexible geometrical design & colouring programs. £17.00
- Computers at Work – Primary £17.35
- Espana Viva – 3 Discs £19.95
- WHITE KNIGHT Chess game £16.00
- A Vous La France £29.00
- Six French Games – Aimed at pupils in their first year of French, but also useful as revision for more advanced students 11 years+ £26
- More French Games – Another 6 games 12 years+ £26
- Au Restaurant and Accident de Route 12 years+ £26
- Boulogne and Oh-Les – 2 programs for beginners £26
- Letters to French Penpals – 11 years+ £26
- French Programs with Henri Beret – The programs in this series present vocabulary, grammar and role-play phrases in the form of animated games. 11-16 £22
- Six German Games – Aimed at pupils in their first year, but useful as revision for more advanced student of German. 12 years+ £22
- More German Games – Aimed at pupils in their 2nd year of learning German. 12 years+ £22
- Computer Control – This is a package of 3 programs simulating control of a greenhouse, a robotic arm & a chemical plant. 14-16 years £26
- PUNCMAN Learning punctuation
  - Puncman 1 & 2 for 7 – 13 years £15
  - Puncman 3 & 4 for 8 – 14 years £15
  - Puncman 5, 6 & 7 for 8 – 15 years £15
- Yes Chancellor – A chance to take over number 11 at Downing Street. 12 years+ £18
- Letters & Pictures – Introduces phonic skills to Infants 6-8 years £15
- Numbers & Pictures – Early number learning is a great fun (4-6 years) £15
- Note Invaders – Budding musicians can learn the notes on the Clef with this elegant game 3 programs (7 to Adults) £15
- Maps & landscapes No. 1 (9-14 years) £18
- Help Your Child learn Basic Map work No. 2 (9-14 years) £18
- Spelling Week by Week (6-14 years) £18

Archi Educational Software

- Animated Alphabet (3-6 yrs) £21
- Arcventure (8-12 yrs) £29
- Bookbinder £43
- Bumper Disc £14
- Bumper Disc 2 £14
- Craftshop 1 £26
- Craftshop 2 £26
- Converta-Key £16
- Data Word £16
- Desktop Stories £35
- DigiSim £35
- Dream Time (5-7 yrs) £23
- Farm (5-7 yrs) £19
- Fleet Street Phantom (9-13 yrs) £25
- Fun School 3 Red (up to 6 years) £17
- Fun School 3 Green (6-8 years) £17
- Fun School 3 Blue (8 years +) £17
- Gate Array Teaching System £68
- Glimpse Clip Art Utility (7-16 yrs) £8
- Highlighter (6-16 yrs) £42
- Jigsaw £28
- Mapventure (9-13 yrs) £24
- Microbugs £24
- Money Matters £16
- Nature Park Adventure (7-9 yrs) £27
- Numerator £60
- Picture Book £16
- Recall (6-13 yrs) £39
- Sellardore Tales £24
- Snippet £26
- Space Mission Mada (9-13 yrs) –
- Sting of the Dump (9-13 yrs) £22
- Target Maths £16
- Viewpoints (9-12 yrs) £33
- Wizard's Revenge (7-10 yrs) £17
- Worst Witch (7-10 yrs) £25

Graphics, Art, Design & Games

GRAPHICS

3D Construction Kit	£39
Arc Light	£46
ARCtist	£19
ARCticulate	£19
Atelier	£65
Artisan II	£45
Artisan Gallery	£16
Autosketch II	£65
Cataclysm	£19
Craftshop 1 & 2	£28
Cyber Chess	£38
Euclid 2	£50
Graph Box	£59
Graphbox Professional	£107
HotLink Presenter	£40
Kermit	£46
Lost Temple	POA
Mad Prof Mariarti	£17
Mogul	£17
Nebullus	£21
Poster	£79
Pro Artisan	£70
Prime Art	£69
Render Bender 2	£95
Revelation 2	£80
Snippet	£21
Tween	£29

GAMES

Air Supremacy	£17
Apocalypse	£14
Arcade Soccer	£14
Avante Garde Fonts	£23
Boogie Buggy	£14
Break 147 + Supa Pool	£19
Bughunter in Space	£13
Chess 3D	£14
Chocks Away 2	£14
Chocks Away Extra	£14
Conqueror	£15
Corruption	£18
Elite	£33
Enter the Realms	£19
E-Type Compendium	£20
E-Type Designer	£13
Family Favourites	£13
Grievous Bodily Arm	£19
Holed Out Designer	£13
Holed Out Golf Comp	£20
Hostages	£14
Inter Dictor 2	£26
Iron Lord	£15
Jigsaw	£27
Lemmings	£20
Masterbreak	£16
Man at Arms	£14
MahJong Patience	£15
Manchester United Europe	£19
Mig 29	£24
Nevryon	£14
Olympics	£14
Pandoras Box	£18
Pipe Mania	£17
Power Band	£14
Puncman 1 & 2	£16
Puncman 3 & 4	£16
Pysanki	£14
Quazer	£10
Real McCoy	£22
Real McCoy 2	£23
Redshift	£14
Return to Doom	£16
Repton 3	£14
Saloon Cars Deluxe	£27
Spitfire Fury	£22
Splice	£25
Sporting Triangles	£24
Superior Golf	£14
Superpool + Break 147	£19
Swin	£22
Talisman	£12
Timewatch	£24
Trivial Pursuit	£22
Twin World	£15
U.I.M.	£23
White Magic 2	£15
Wimp Game	£13
Worldscape	£16
XFire	£19
Zelanites	£23

Miscellaneous

Ancestry	£59
Arccomm 2	£38
Arcterm 7	£64
Armadeus Sound	£60
BBC DFS Reader	£6
Broadcaster Loader	£65
Compression (CC)	£38
Equasor	£38
FlexiFile	£97
Genesis Plus	£68
Genesis 2	£99
Investigator 2	£22
JX Archi Colour Printer Driver for Citizen & Star Printers	£15
Magpie 2	£42
Notate	£42
Numerator	£66
Pin Point	£65
Presenter 2	£29
Presenter Story	£145
Rainforest	£17
Revelation 2	£95
Rhapsody in Blue 2	£45
Score Draw	£46
Show Page	£127
Speech!	£15
SWIV	£19
The Victorian	£17
Time Tabler	£549
Toolkit (Clares)	£35
Touchtype	£40
Tracker	£39
Turbo Driver BJ10E	£42
Vox Box	£46
WorldScape	£17

Archimedes External Disc Drive Interface

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Upto 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead.

Price £21

Back Plate Extension

- A300/400 £15; • A300 £14

LANGUAGES (Archimedes)

ISO-PASCAL; FORTRAN 77 **£77 each**

Assembler; LISP; Prolog X **£149 each**

ANSI C Rel. 3	£125	Logotron Logo	£45
Macro Assembler	£40	Risc Basic	£120
Robo Logo	£69	Risc FORTH	£110
BASIC Compiler	£77	Cambridge Pascal	£95

Connecting Leads

(All ready made and tested)

CASSETTE LEADS 7 pin DIN Plug	
to 3 pin DIN Plug + 1 Jack Plug	£2.50
to 7 pin DIN Plug	£3.00
to 3 Jack Plugs	£2.50
6 pin DIN to 6 pin DIN Plug (RGB)	£3.00

Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single **£3.00;** Dual **£3.75**

Disc Drive Interface Leads

BBC to Disc Drives Ribbon Cable
Single **£4** Twin **£6**

Miscellaneous Connectors

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	–
6 way Power Connector	120p	150p

Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

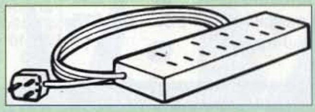
Watford POWER DUCK **£8**

Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage translent spikes/surges caused by lightening or thermostats switching.

Protection for only **£8.50**

4 Way Mains Distribution Socket



4 way top quality mains trailing sockets. Supplied wired up with mains plug ready for use. Can be screwed to floor or wall if required. Very useful for tidying up all the mains leads from your peripherals.

£9.50

Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

£16

8 Way DIP Switch

Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ keyboard

Only **£1.00**

CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 250234 or 233383

Continued→ → → → → → → → →

Computer Concept's ROMS

Disc Doctor	£18
Inter BASE	£49
Inter CHART	£25
Inter SHEET	£37
Inter WORD	£36
Mega-3 ROM	£76
Spell Master	£42

Wordwise plus

£40

We are giving away absolutely **FREE,** the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

Word-Aid

This advance utilities ROM extends the power of your Wordwise plus ROM.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document.
- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear test-segment area.
- BBC B, B+ and Master compatible.

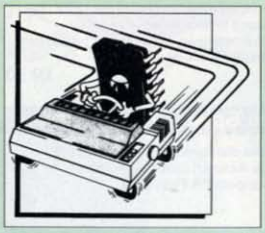
Only **£24**

(N.B. Word Aid requires a Disc interface in your Micro)

Acorn ROMS

View 3.0 ROM	£45
Viewsheet (Acornsoft)	£36
Viewstore	£36
Viewspell – 80T disc	£25
View-Index	£12

View Printer Driver ROM



View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

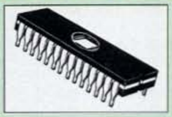
Price: Only £29

Mini Office 2 – Disc

for BBC B & B+	£12
for BBC Master	£14
for BBC Compact	£16

(When ordering please specify for which Micro & 40 or 80T Disc)

Assorted ROMS



ACORN ADFS	£25
ACORN BASIC 2 plus User Guide	£22
Acorn BCPL	£42
ACORN DNFS	£17
Acorn FORTH	£32
Acorn OS B+	£25
Acorn OS 1.2	£14
Beebmon	£22
Dump Out 3	£25
Graphics Extension Rom	
GXR-B	£21
GXR-B+	£22
Logotron LOGO	£43
MASTER OS ROM	£38
Master ULA (47)	£15
Master ULA (60)	£10
Numerator – Archi	£69
Numerator – BBC	£39
Pendown ROM	£32
Rom Manager	£20
SERIAL ULA	£13
TED	£35
Termulator Master	£32
Video ULA	£14
1Mb OS ROM	£39

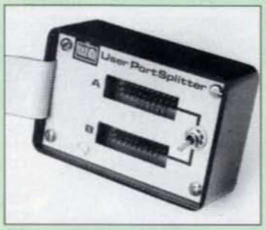
CHIP SHOP

1 MB-10 DIL D-RAM	£4.50
1 MB ZIF D-RAM	£4.00
256K x 4-8 DIP	£4.75
256K x 4-8 ZIF	£4.00
SIMs and SIPs	
256 x 9-8	£11
1Mb x 9-10	£26
1Mb x 9-8	£39
DS3691	£4.50
DS88LS120	£5.25
LM324	£0.45
SN76489	£5.50
SAA5050	£8.75
UPD7002	£6.00
2764-250nS	£3.00
27128A-250n (12V5)	£2.50
27128-250nS (21V)	£4.00
27256-2	£3.00
27512-2	£4.50
27C101G (1 Meg)	£7.00
4013	75p
4020	£1.00
4164-10	£1.55
4464-10	£3.50
4816 RAM	£2.00
41256-8	£2.00
41256-10	£1.50
6264LP-8K	£4.00
6502A CPU	£5.00
65C02 3M	£9.75
65C12	£9.00
6512A	£10.00
6522	£4.00
6522A	£5.00
62256ALS-15	£10.00
62256P-12	£8.50
6818	£4.00
6845SP	£6.00
68B50	£2.95
68B54	£7.50
7438	50p
74LS00	50p
74LS04	50p
74LS10	50p
74LS123	£1.00
74LS163	£1.00
74LS244	£1.00
74LS245	£1.00
74ALS245	£2.75
74LS373	£1.00
74LS393	£1.00
75453	£1.00
75159	£3.00
8271	£39
9637	£2.00
ICL7673PA	£3.00

Acorn Speech Synthesizer package complete, for the BBC B Microcomputer

Special Offer £14

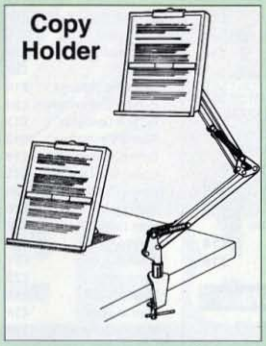
User Port Splitter Unit



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

Excellent Value at **£22**

Copy Holder



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding your paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip.

Desk Top **£8**
Angle poise **£12**

NEW

Copy holders as above but with a battery operated, remote controlled cursor/ruler. (By hand or foot pedal.) (Batteries 2 x AA not included.)

Desk Top **£15**
Angle poise **£20**

CREDIT CARD
24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

TEX EPROM ERASERS

EPROMs need careful treatment if they are to survive their expected lifetime. Over erasure of EPROMs very rapidly turns them into ROMs!

The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast.

- **ERASER EB** – Standard version erases up to 16 chips. £34
- **ERASER GT** – Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. £36
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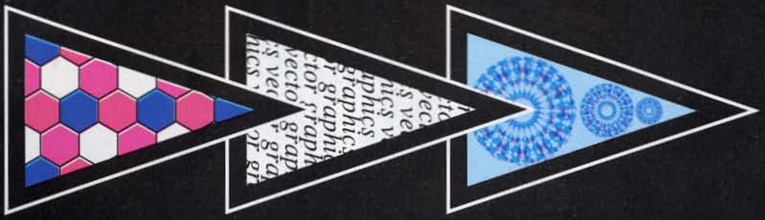

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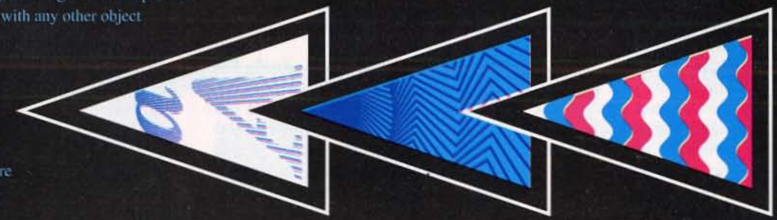


THE MAD hatter

Putrid Power Ploys

WE all know that power corrupts and that absolute power corrupts absolutely, well the Magnetic Scrolls adventure Corruption is a pretty powerful adventure.

It's also quite difficult and I have had a fair number of cries for assistance from readers.

I am not going to give a move-by-move solution exactly, but rather indicate what actions need to be performed at certain stages in the adventure.

Apart from using my own grey cells, I have consulted solutions sent in by two readers, Matthew Jacques and to a lesser extent J. Terry who completed the game but failed to get the villains arrested. This cost him 25 points.

The game scenario is as follows: You are offered a partnership in the City firm of Rogers and Rogers (your name is Derek Rogers) as a result of a clever deal you did with the company Scott Electronics.

You are, in fact, the fall-guy who is to be framed, and your task in the adventure is to gather the evidence that will clear your name and allow the baddies to get the justice they deserve.

The important thing to realise is that a number of significant and time-critical events are taking place. Indeed, anyone playing Corruption without the kind of help offered here will have to take several bites at the cherry: It would be a sheer fluke for anyone to get the correct sequence first time.

You start at 9am having just arrived in your new office and you have to be pretty sharp here if you are to get the full flavour of things. Don't forget, you'll have to make your own map – I'm not performing that chore for you.

You need to be outside the dealing room in time to give David a message from them at 9.06 am and it will pay you to listen at Hughes' door once David has gone inside.

You also need to grab a ledger and a share certificate from the filing cabinet in your office as these are important evidence.

Next you need to go back to Margaret's office, because you heard earlier that David was expecting her to have a cheque ready for him a little later that morning.

She puts the cheque into an envelope at 9.15 am – and again, this is important evidence. You should grab it immediately, and you will be considered a helpful messenger-boy by Margaret.

At some point you should have checked your inventory to find that, in your jacket pocket, you have a set of car keys and a credit card.

My advice is to put them in your briefcase as soon as you can find a convenient moment since, at one crucial point in the game I suddenly remembered that my jacket was now missing and, moreover was irretrievable.

That sort of discovery does the old blood pressure a lot of good. Moral? Make regular saves throughout the game. More next time.

Flying high?

HERE's the final part of Barbara Gibb's meticulous solution to Castle Blackstar, a most entertaining and well thought-out tape-based adventure for the BBC Micro.

On leaving the Temple, go south, north, southwest and then three times west, before going north and down to the tunnel entrance, where you should light the lamp. Now go down once more to the narrow tunnel with a trapdoor and a message.

Read the message, close the door, go up twice and extinguish the lamp before moving south, east twice, south, west and down to the well bottom.

It's time to refill your lamp again ready for the final push. Light it and go north four times, southeast, east, northwest, down, northwest and then northeast to the cell block.

Now go east to the *duel* room and then up to the *dual* room, down twice, north twice and west twice to the warm room.

From here go down to the windy pit which – as Barbara Gibb remarks – would have blown out your lamp if you had not closed the trapdoor in the narrow tunnel. What's more, the lamp would then refuse to relight (owing to the draught) thus preventing any further progress.

This sort of thing is usually the sign that you are approaching the climax of an adventure, as is the case here. Two moves north and one down will take you to the Orb room. As you take the Orb, you will hear noises which are the sound of certain escape routes from the castle being cut off. Rotten, isn't it?

West, east, west and up are the moves which will return you to the warm room: From here, go east three times, northwest and twice north to the Throne room.

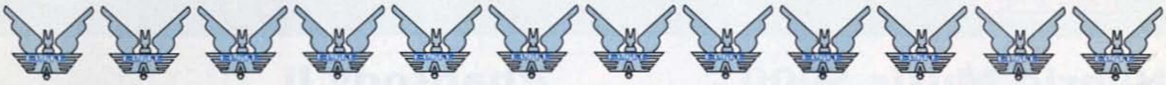
Take the dynamite, push the throne and you will be able to go down to a secret passage. Move west to the dead end and light the dynamite there. This will reveal a hole in the wall – so go down, east, southeast, up, southeast then south and north to reach the M doorway.

Return to the cove by going north four times, southwest, south, west, north, northwest, four times south and finally northwest to the boat. From here, go east to the narrow tunnel and open the door. Barbara confesses she doesn't know why, but it adds an extra point to your score which should read 236 at this stage. My guess is that it's for returning the breeze to the windy pit.

Move west again to the cove and bail out the boat so that you can sail it, then go south twice, southeast, bail again and continue south, east twice and down to the rocky bay.

From here you must go west, northwest, down, northwest again, then northeast and enter.

Next travel north, east twice, southeast, west, southeast, east, north, northwest then north and read the note. Now enter, take the



Elite update

HERE'S a little bit more from Andrew Cawte on the ArcElite Missions he's dealt with so far. He discovered Mission 3 while still in Santaari Galaxy on attaining Competent status.

Having casually wiped out a luckless pirate (Rantan Pino) more or less by mistake, Andrew was informed that Pino's son Zurin was out for blood.

Zurin flies a brown Cobra MkIII which has a cloaking device of sorts – he doesn't actually show up on your scanner – and a Missile AutoLock system.

Having zonked Zurin, Andrew returned to the Space Station and found he'd been awarded a Missile AutoLock all of his own.

Andrew doesn't seem to have figured out the primary purpose of the AutoLock system, though. Veterans will recall having locked a missile on to an enemy and then having to hold the launch while some hairy laser combat takes place.

Hands up all those who have then blasted the missile target by mistake? The AutoLock mobile cross-hairs help prevent that.

The fourth mission sent Andrew chasing round known space on an errand of mercy for GalMed. They are clearly as hard up (or mean) as GalFam and he was distinctly peeved at the measly monies offered as a reward. My son, virtue is a reward in itself – wear your halo with pride and continue to trade cannily.

Andrew was puzzled by Space Beacons, and wondered what they are for. The answer is simple: They are there for fun, to practice flying through – if they are in the right configuration – but NOT for scooping up or shooting at.

Finally Andrew has a couple of hints and a query: If you call up the data on Riedquat (Santaari Galaxy) you'll probably smile.

If you load ArcElite then click Menu over its icon on the icon bar and move the pointer to *Info* and wait a couple of minutes you'll discover the copyright line becomes a scrolling message – and yours truly gets a mention, too.

His query has to do with a ninth Galaxy: There's a name for it, but no galaxy in his version and he wonders why. ArcElite had to be totally faithful to the original – and the original had only eight galaxies.

Christian Weber owns an Electron version of Elite and it looks very much as though he has missile-blasted something that was totally invisible to his scanners: Could it be that the dear old Elk has C and D facilities?

Richard Seymour is an Elite addict, and – when he wrote – was Deadly. He wonders if he has the C and D ship on his (BBC B) version: The answer is *Probably*.

He also has a query about a friend's Amstrad version. No, Richard, your friend isn't lying: The solution to that mission is to refuel at the sun before docking at the Space Station. It takes loadsa kills to become Elite and (on the BBC version) I am Elite 10 times over: I'm working on things so far as ArcElite is concerned.

Moans and Mumbles

I've had a couple of comments from an old hand at adventuring, Richard Forster. First was a moan: He reckoned that I was too explicit in the help I offered in my review of **Wonderland**.

Admittedly, Richard hadn't bought the game then – I hope he has now – but those of you who are familiar with that adventure will know that I gave fairly specific help for about the first five per cent of it, and that's all.

Richard also asked if mathematical puzzles of the kind presented by my predecessor Alice could be included in the column.

The simple answer is: *No*. I'm no mathematician, rather a philosopher-cum-historian. I did set what I thought was an easy puzzle once, had no takers, and one reader reckoned it was for Ph.Ds only. Ah well, you win some and you lose some.

broomstick and leave once more. The lamp is no longer needed, so you might as well drop it here.

Do you remember that vision you received in the temple when you prayed? You have to take the Orb *up* to the goddess – and to do that you must learn the secrets of broomstick riding. Personally, I prefer my pram after reading about Terry Pratchett's character Granny Weatherwax.

If you examine the plaque on the broomstick you'll find it reads as follows:

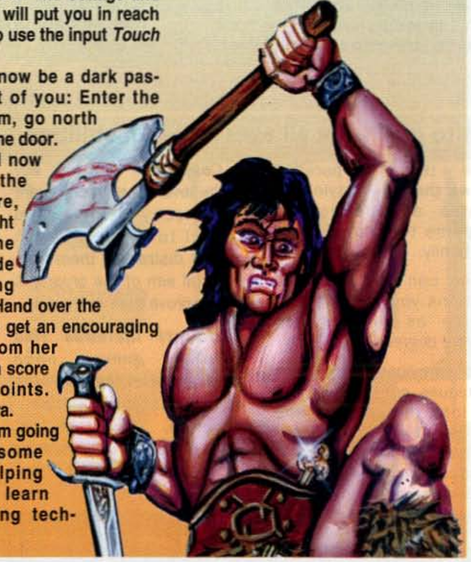
Wraith GXL 2000 bat power, Automatic regulating broom. Attempt device activation code and reverse back again. General Magic Inc.

This message hides the password – actually a well-known one in magic circles – and so, provided you have dropped everything except the orb and the broomstick, saying *Abracadabra* will get you airborne. Your location will now be described as over the cottage and two moves up will put you in reach of the stars, so use the input *Touch stars*.

There will now be a dark passage in front of you: Enter the machine room, go north and examine the door.

You should now recognise the message here, so say the right word and the door will slide open enabling you to enter. Hand over the orb and you'll get an encouraging few words from her ladyship and a score of 250 points. Thanks Barbara.

Next time, I'm going to devote some space to helping beginners learn some mapping techniques.



HATTER'S HELPLINE

Mrs R.M. Eastwood has a problem in the Minerva adventure Maddingley Hall; I don't know the answer – and nor do Minerva. How can she get Veronica to accompany her to the study?

While we are on the business of cries for help, K. Hallam is stuck in a game called Spellbinder. I've never heard of it – can anyone cast a ray of light here?

Nick Hill has a query about a golden oldie, Twin Kingdom Valley. This was a superb tape-based illustrated adventure for the BBC and Electron machines. He asks if it had a *Save* and Restore facility. The answer is Yes, but it takes quite a while – just about the only weakness in an otherwise excellent adventure.

I've had a letter all the way from Oz: Duncan Burbridge has come up with help for that burger of a problem in Rise in Crime: Hide the burger in the book and you can then take it out of the restaurant. The burger is then used to steal the debonder by squeezing it over the assistant droid – it's not needed in the DIY shop after all.

THE MICRO USER

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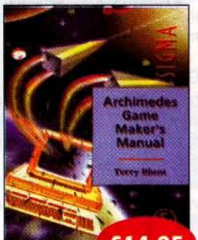

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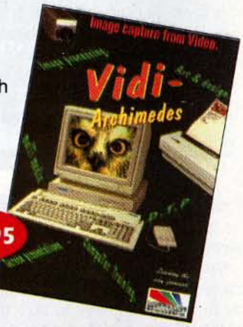
Vidi Archimedes



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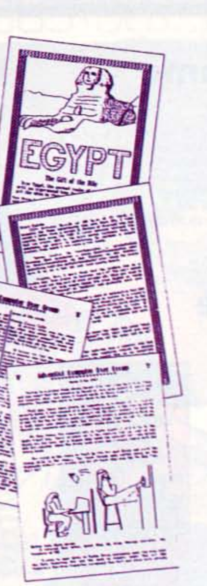
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MEMO

Jabberwocky

'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe:
All mimsy were the borogoves,
And the mome raths outgrabe.

"Beware the Jabberwock, my son!
The jaws that bite, the claws that c
Beware the Jubjub bird, and shun
The frumious Bandersnatch!"

The mouse's tale

"Fury said to a mouse, That he met in the house, 'Let us both go to law: I will prosecute you. Come, I'll take no denial: We must have a trial: For really this morning I've nothing to do.' Said the mouse to the cur, 'Such a trial, dear Sir, with

INVOICE

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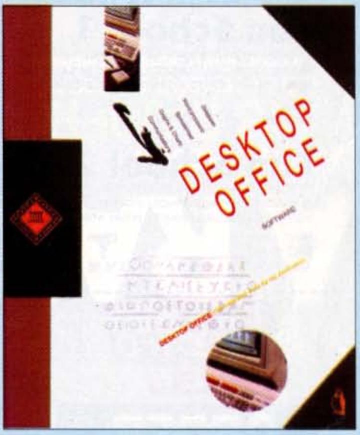

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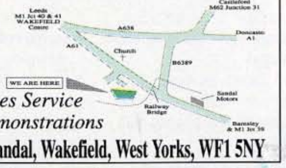
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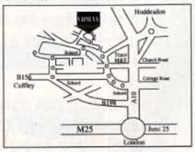
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PC problems

I RECENTLY upgraded my old PC emulator for the new version. When loading a game called Pirates – an adventure written for the IBM PC – I get the error message: Booting from non-Dos Disk use Ctrl+Alt+Del to reboot.

I did this about five times but with no joy. The game worked excellently with the old emulator. Do I need a new MSdos or DRdos disc or is there something completely wrong with the emulator? – **Simon Winnard, Swinton, Manchester.**

● Our *PC Today* colleagues have run into this situation with genuine PCs so it's not the emulator. Basically the game won't work with the later version of MSdos or DRdos that you're using, so just boot up with the earlier version when you want to play.

File recovery from recursive directory

I HAVE just read Keith Butcher's letter in the April 1992 edition of The Micro User *and noticed that he mentions a problem that I have come across once or twice.*

To retrieve files from the recursive directory structure, here's a short program in Basic which searched for the files and copies them out the of the mess of directories they are in. It then deletes the unwanted directory tree and returns the disc to its original state.

To use this program, run it and then enter first the name of the program directory, then the pathname leading to its top level – omit the name of the directory itself. The program will then recover the files.

```
10 ON ERROR GOTO 110
20 REM Recurse
30 REM By Richard Holland (13)
40 REM Recovers files lost in recur-
sive directories
50 INPUT"Please enter the directory
: "a$
60 INPUT"Please enter where it first
appears : "b$
70 OSCLI"DIR "+b$
80 REPEAT
90 OSCLI"DIR "+a$
100 UNTIL ERR=67798
110 IF ERR<>67798 END
120 *UP 1
130 c$=LEFT$(A$,2)+"2"
140 OSCLI"COPY "+a$+" "+b$="."+c$+"
~CAQRV
150 OSCLI "DIR "+b$
160 OSCLI "DIR "+a$+" ~CFR~V"
170 OSCLI "DIR "+b$
180 OSCLI"RENAME "+c$+" "+a$
190 PRINT"Finished."
200 END
```

I hope this program helps out anybody stuck with this problem. – **Richard Holland, Overton, Hants.**

Happy archiving

I SAW your review of Archivist in the May issue of The Micro User *and decided to give you a long-term user's view. I am a satisfied user of Archivist – which is now available in an improved form as version 2.30i.*

The new version offers improvements in feel, ease of use and performance as well as routines which take advantage of the extra power of Risc OS 3.

At its modest price of £25 it cannot be beaten for its excellent performance. Card formats are easy to design using the separate module and these can be entered and manipulated in all the expected ways. Unusually individual cards may be printed using Risc OS drivers and outline fonts.

Data may also be exported as CSV files, plain text or as drawfiles for inclusion in DTP. Oregan also supply a public domain importer to convert files from other data handling packages.

You reviewer commented that the search facilities though powerful are unfriendly. This has been much improved in the latest version which includes an ***easy search*** *option which is very simple to use.*

You simply type in the data to be searched for on a blank copy of the current card's format and press Return. This suffices for most purposes.

The admittedly complex full search facility is retained as it allows powerful macro and selective multi-field searches to be carried out once the format is learnt.

Details are particularly easy to enter by clicking and pointing at field names on an existing card or at functions and operators on the complex search window.

Alternatively, the ***search expression*** *used by the computer in an easy search is automatically entered.*

I would underline that Archivist in its latest version is a first class product providing a powerful but low-cost database particularly suitable for home or educational use.

In addition, Oregan's support for such a modestly priced product is second to none. Comments from existing users have led to the recent improvements and registered users have been sent the latest upgrade free of charge. – **Andy McMullon, Scampton, Lincoln.**

Electron pals

I HAVE been reading The Micro User *for over three years and I used to read* Electron User *in which I had a letter published about a pen pal.*

I was really pleased when, in the same issue, there was a letter from Oliver Debus in West Germany. My mum wrote to Oliver and we wrote to each other. He sent me his new address when he moved – but I have lost it.

I have moved too and I would like to get back in touch with Oliver. My new address is 40 Dursley Road, Cam, Dursley, Gloucestershire GL11 6PP.

I'd also like some advice about programming in assembly language and machine code so I can program my own games with real graphics. I have already written a Cashbook and Cash

Rom and Ram troubles on an Archimedes 410

I HAVE found Mike Goldberg's Rom and Ram column very useful in helping me to get to know my Archimedes 410, although as a totally computer illiterate grandmother I was somewhat abashed to learn that this feature is meant for younger readers.

Up until now I have been doing fine. However, in the February issue I struggled to get the images to move in a controlled fashion around the screen.

Eventually, by putting colons at the ends of lines 80, 160 and 170 I succeeded in doing so. But if I am too enthusiastic about pressing the various keys it deteriorates into endless lines across the screen.

My computer refuses to shows the slightest interest in MAR2 from the March issue though. With all these new concepts to understand I am unable to move in any direction. What does line 70 PRINT''''' mean?

And line 80 just disappears when listed so what is the point of leaving it blank? And the biggest puzzle of all – why so big a gap between Line 80 and Line 490?

MAR6 at least elicits the response Unknown or missing variable at line 70 *but once more I cannot think of anything sensible to do about it.*

In fact, I am beginning to feel even more stupid than Rom. I really must say I salute your younger readers.

Please can you help me? I don't seem to have anyone around here I can ask and I am most reluctant to give up on what is becoming the most fascinating activity in my whole life. – **Mrs. M. T. Webb, Durbanville, South Africa.**

● Unfortunately Rom and Ram have been directed at the 8-bit BBC Micro from the March issue which is one reason why the programs have not worked correctly.

The programs will work on the 6502 emulator. However not all the problems you describe are caused by using a 32-bit machine.

The blank lines are there purely as separators and in the original programs each has a space on the line, we should have replaced the spaces with colons ourselves – sorry about that.

The line number gap is to allow the programmer, Mike, to add lines without running into the DATA statements.

Using an apostrophe in a PRINT statement forces a new line to be printed on screen. Using five creates five new lines then the end of the PRINT itself forces a sixth.

The error message about variables can have one of two sources, either the line mentioned is wrong or the place where a variable is first mentioned is wrong. Take the following example:

```
10 nunber = 1
20 PRINT number
```

This will generate the error message about a variable being unknown at line 20.

However, it's fairly easy to see that line 10 has been mis-typed. I hope this helps – please don't give up, we'll ask Mike, Rom and Ram, the cat and the ducks to do some more Arc-oriented programs for publication in a future issue.

register programs among others. – **Paul Matthews, Dursley, Gloucs.**

● If you're following Rom & Ram that will give you a few hints about methods but for actual machine code programming you would be best going into a large bookshop that has technical books and seeing what they have on the BBC Micro and the 6502 chip.

Although the Electron and BBC Micro don't have a big commercial market any more they are very good computers for learning to program and can give you an excellent grounding on which to build your future expertise.

Daisy chained?

MY daughter was given a BBC B issue 7 for Christmas and I have just received a Ricoh RP1500Q daisy wheel printer.

Could you tell me if the two machines are compatible, and if so how I connect them? I am not very computer-oriented so please make any answer as simple and straightforward as possible.

Are there any companies producing public domain software for the BBC? – **F. Worner, Ferndale, Mid-Glamorgan.**

● Yes the printer will work with the micro, but there are some points to be aware of: You'll need a connecting lead, the Ricoh will probably need a serial one. This plugs into the back of the micro into the serial socket.

The difficulty with serial connections is that the data can be transferred in a number of different formats and speeds, and both machines have to be in agreement otherwise nothing happens or you get garbage. You may need the help of technically-experienced dealer or friend with this part.

You won't be able to print graphics but the text will be very crisp. This is the major advantage of daisywheels, but the major disadvantage is that they are extremely noisy as each letter is slammed on to the paper by a hammer.

Probably the best software to use is Inter-Word from Computer Concepts, because it stores the necessary configuration to drive the printer so you don't need to keep resetting the software before you start.

Teri Paul's PD pages outline some of the programs available in both the Archimedes and BBC PD world. She also features a list of the libraries who supply PD software.

BBC Lemmings?

IS THERE a version of Lemmings or Oh no! More Lemmings for the BBC Micro? I'm always looking forward to Friday because I go to my friend Toby who has an Amiga and got it with Lemmings and has bought Oh no! More Lemmings. I have a BBC Micro with a 5.25in disc drive. – **William Whitaker, Stockport, Cheshire.**

● Lemmings and its sequel are only available for the Archimedes from Krisalis. There's a chance that a BBC software house might write an 8-bit version but don't hold your breath.

Typing in vain?

I AM using a recently-purchased A3000. Using the Basic available on F12, I have keyed in the code for Arena 6502 from your January issue. However, it will not run and stops at line 60 on listing II (line 60 PHA) with the message No such mnemonic.

I have also tried running the program under the 6502 Host without success. Using the 6502 Host I am unable to key in all the lines. For example, line 50 in Listing II – line 50 [OPTL. No square brackets appear on my screen when I press the appropriate key.

Am I doing something wrong, or trying the impossible? Or is the answer to subscribe and get the free listings discs? – **A. Taylor, Wadhurst, East Sussex.**

● Of course we think subscribing is your best approach, on the other hand you can learn a lot from typing in programs – although not so much from such tightly programmed machine code as in Arena 6502.

Arena 6502 won't work on the Arc in native mode but works fine on the 6502 emulator. On an ARM3 machine it runs very fast and smoothly and with the latest version of the emulator you even get the sound effects.

The square brackets appear as arrows but the program will work.

ALL programs printed in this magazine are exact reproductions of listings taken from running programs which have been thoroughly tested.

However, on the rare occasions when mistakes occur, corrections are published as a matter of urgency.

Should you encounter error messages when you type in the program, they will almost certainly be the result of your own typing mistakes.

Unfortunately we cannot answer personal programming queries concerning mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in these pages.

WANT to write to The Micro User? The address is:

Letters, The Micro User, Europa House, Adlington Park, Macclesfield SK104NP.

Writers of the most interesting letters receive a £10 prize.

512k is too small

I BOUGHT an Acorn 80186 co-processor known as the 512 board for my BBC B+. The board only has 512k and while GemDesktop and GemPaint load perfectly, when I load GemWrite I run into problems.

I cannot use GemWrite unless I expand the board to 1Mb. Why do companies sell a product that doesn't work with standard software? – **Christopher Game, Colchester, Essex.**

● When the 80186 board was first produced 512k was considered sufficient for most purposes. Graphic environments were a thing of the future and it is a fact of life that most won't work within 512k.

I am sorry to be so negative, but your alternatives are really to upgrade your board or your computer if you want to run this type of software. Essential Software are the people to talk to and they're at P. O. Box 5, Groby, Leicester LE6 0ZB.

Missing brackets

MANY readers will be familiar with the excellent Complete BBC Computer User's Handbook *by Dr John Lockley and Douglas Tate and published by Watford Electronics. Among many interesting ideas is the formula called Zeller's Congruence on page 183 for working out the day of the week given the date.*

Unfortunately, some brackets were omitted and the formula should read:

```
(INT(2.66*M-0.2) + D + Y +INT(Y/4) +
INT(C/4) - 2*C) MOD 7
```

where:

D= day of the month
M= month of the year
Y= year of the century
C= century number

The line of Basic (above) will give the day of the week for any date from 1753 onwards. – **Jon Millington, Bristol.**

Memory upgrades

A5000 £1499 Acorn's new machine with RISC OS 3, multisync monitor, ARM3, and 40Mb drive. *An extra 2Mb of RAM (4Mb total) is included free.*
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Beebug ....19+80
Bright Ideas/Desktop 67
Broadoak Computers 87
Clares 16
Computaccount 59
Computer Concepts ....24+IBC
Dabhand Computing ....6+7
Dabs Pres 4
Daco Systems 87
Datashore 64
Davvin Computers 87
Design Concepts 28
Fact Systems 90
I.C.S 10
Ifel 90
Krislairs sw ....42+43
Micro Aid 64
Micromania 80
Morley Electronics ....IFC+3
Norwich Computers 47
Orion Computers ....8+9
Pineapple SW 47
Pyramid Computers 28
Senlac 64
Silicon Vision 23
Skyfall PD 90
Smart Computers 14
Software Bargins 51
Superior Software ....OBC
TMJ 90
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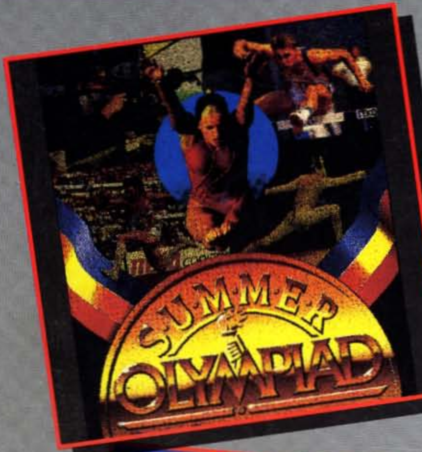

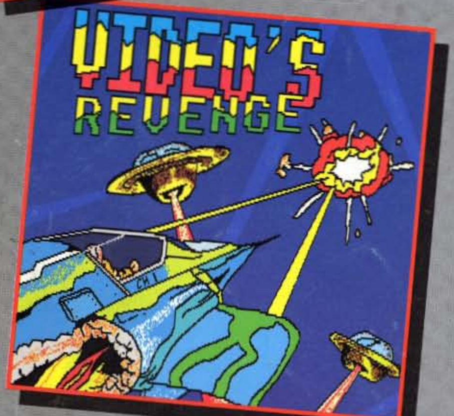

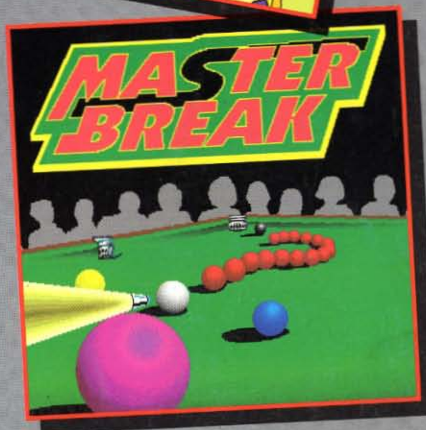

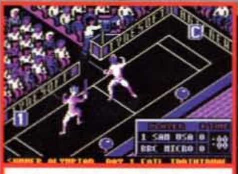

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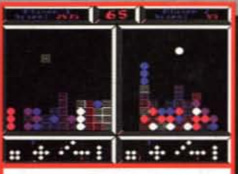

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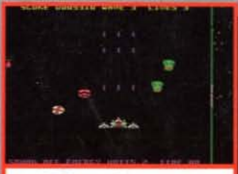

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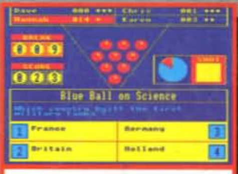

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